United States Court of Appeals
for the
District of Columbia Circuit

TRANSCRIPT OF RECORD

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United States Court of Appeals for the District of Columbia

OCTOBER TERM, 1935

No. 6584

798

MINNESOTA MINING AND MANUFACTURING
COMPANY, APPELLANT,

vs.

CONWAY P. COE, AS COMMISSIONER OF PATENTS.

APPEAL FROM THE SUPREME COURT OF THE DISTRICT OF
COLUMBIA.

FILED OCTOBER 25, 1935.

PRINTED JANUARY 2, 1936.

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., DECEMBER 2, 1935.

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United States Court of Appeals for the District of Columbia

No. 6584.

Minnesota Mining and Manufacturing Company,
Appellant,

vs.

Conway P. Coe, as Commissioner of Patents.

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a Supreme Court of the District of Columbia.

In Equity.

No. 55194.

Minnesota Mining and Manufacturing Company, Plaintiff,

vs.

Thomas E. Robertson, Commissioner of Patents,
Defendant.

United States of America,
District of Columbia, ss:

Be it remembered, That in the Supreme Court of the District of Columbia, at the City of Washington, in said District, at the times hereinafter mentioned, the following papers were filed and proceedings had, in the above-entitled cause, to wit:

1 *Bill of Complaint to Compel Issuance of Patent.*

Filed December 30, 1932.

In the Supreme Court of the District of Columbia.

In Equity.

55194.

MINNESOTA MINING AND MANUFACTURING COMPANY, Plaintiff,

vs.

THOMAS E. ROBERTSON, Commissioner of Patents,
Defendant.

To the Supreme Court of the District of Columbia:

The Plaintiff states as follows:

1. The plaintiff, the Minnesota Mining and Manufacturing Company, is a corporation duly organized under the laws of the state of Delaware and having its principal office and place of business at St. Paul, in the county of Ramsey and State of Minnesota, and brings this, its suit, in its own right.

2. Defendant, Thomas E. Robertson, is a citizen of the United States, is Commissioner of Patents of the United States and officially a resident of the District of Columbia and is sued in his official capacity as Commissioner of Patents of the United States.

3. The jurisdiction of this court depends upon the statutes of the United States relating to the grant and issuance of Letters Patent of the United States, and particularly upon that certain section thereof known as Section 4915 of the Revised Statutes of the United States, as amended by Act of Congress approved March 2, 1927.

4. Heretofore, and prior to the 15th day of August, 1925,
William Luxmore, then a citizen of the United
2 States, was, within the meaning of the statutes of
the United States then in force, the first, original
and sole inventor of certain new and useful improvements
in Waterproof and Oil-Proof Flexible Abrader not known
or used by others in this country before his invention or

discovery thereof, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his hereinafter mentioned application for Letters Patent of the United States, and not in public use or on sale in the United States for more than two years prior to the date of his said application for said Letters Patent, and which had not been abandoned; and for which no application for any foreign patent was filed by him or his representatives or assigns more than twelve months prior to the filing of his application for letters Patent of the United States as hereinafter mentioned.

5. That on the 15th day of August, 1925, the said William Luxmore being then, as aforesaid, the first, original and sole inventor of said improvements in Waterproof and Oil-Proof Flexible Abrader, made application in writing to the Commissioner of Patents of the United States for the grant of Letters Patent for said invention, and duly filed on said day an application for Letters Patent of the United States, Serial No. 50,477, disclosing, describing and claiming said invention in accordance with the then existing laws of the United States all as will fully appear by said application Serial No. 50,477 on file in the United States Patent Office or by a duly authenticated copy of said application as filed, ready here in court to be produced.

6. That, thereafter and in accordance with the Rules of the Patent office in such cases provided, the said application was amended to include the following claims:

3 *Claim* 25: The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing to form the complete abrasive article.

Claim 26: The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing and heating the same to form the completed abrasive article.

Claim 27: The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

Claim 28: The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing and applying heat thereof at approximately 150°F. to form the completed abrasive article.

Claim 29: The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous condensation product in a volatile thinner to penetrate the backing and saturate the fibres, airdrying the sheet so treated to partially set the resinous impregnating coating, applying a binder coat of a synthetic resinous composition, partially setting the binder coat so applied, anchoring a grit or layer of abrasive particles in the binder coat and then finally baking the article so made.

Claim 30: The method of making an abrasive article which includes as steps thereof, employing a backing, impregnating the backing with a synthetic resinous composition in a volatile thinner, partially drying and setting the coating so applied to the backing, then applying a binder coat of a synthetic resinous material, applying a grit or layer of abrasive particles to the binder coat so
4 applied before the binder coat has set to any appreciable extent and then baking the article so coated at approximately 150°F. to completely form the abrasive article.

7. Plaintiff, said Minnesota Mining and Manufacturing Company, is the sole owner of the entire right, title and interest in and to said improvement or invention and said application for Letters Patent of the United States, Serial No. 50,477, by virtue of an assignment in writing to plaintiff, recorded in the United States Patent Office June 24, 1930, Liber Q144, Page 330, a duly authenticated copy of

which said assignment, as filed, is ready here in court to be produced.

8. Thereafter such proceedings were had upon said application Serial No. 50,477, that on July 11, 1931, the said claims set out in paragraph 6 above were finally rejected by the Primary Examiner of the Patent Office in charge thereof. Thereafter, and within the time allowed by law for the purpose, plaintiff appealed from said decision of the Primary Examiner to the Board of Appeals of the Patent Office, and thereafter on July 1, 1932, the Board of Appeals rendered its decision whereby it affirmed the decision of the Primary Examiner and refused to allow the said claims. No appeal has been taken from the decision of the Board of Appeals to the Court of Customs and Patent Appeals, and there are no adverse or opposing parties to this suit.

9. Plaintiff is willing and hereby offers to pay all expenses of this suit as if and when ascertained by this Honorable Court, and any and all lawful fees and charges arising from or incidental to said application and the issue of Letters Patent thereof.

10. The defendant, Thomas E. Robertson, Commissioner of Patents of the United States, has refused and still refuses to grant Letters Patent of the United States to the plaintiff, Minnesota Mining and Manufacturing Company, on said application Serial No. 50,477, assigned to plaintiff by said William Luxmore for the improvements or invention set out in the claims recited in paragraph 6 hereof, though plaintiff, Minnesota Mining and Manufacturing Company, is lawfully entitled thereto and is the sole owner of the entire right, title and interest in and to said invention as hereinbefore alleged.

5

Wherefore, plaintiff prays that a copy of this bill of complaint be served on said defendant, Thomas E. Robertson, Commissioner of Patents, together with a writ of subpœna ad respondendum issuing out of and under the seal of this Honorable Court requiring him to appear and make answer to this bill of complaint to perform and abide by such order and decree herein as to this Court shall seem meet.

Plaintiff further prays for a decree of this Court adjudging that plaintiff's assignor, William Luxmore, is the original, first and sole inventor of the invention set forth in the claims hereinbefore quoted in paragraph 6 above, and that plaintiff is entitled according to law to Letters Patent therefor.

BRENDAN J. McCANN,
Solicitor for Plaintiff.

Of Counsel:
PAUL CARPENTER.
J. T. BASSECHES.
H. H. BENJAMIN.

STATE OF ILLINOIS,
County of Cook, ss:

Brendan J. McCann, being duly sworn, deposes and says that he is the attorney for the plaintiff in the foregoing bill of complaint and that he has read the said bill of complaint and believes the facts stated therein to be true.

BRENDAN J. McCANN.

6 Subscribed and sworn to before me this 24th day of December, 1932.

[SEAL.] NELL LAMPTON,
Notary Public.

Answer to the Bill of Complaint.

Filed January 10, 1933.

* * * * * * *

To the Honorable the Judges of the Supreme Court of the District of Columbia:

Thomas E. Robertson, Commissioner of Patents, defendant herein, in answer to the Bill of Complaint alleges on information and belief as follows:

1. He admits for the purpose of this suit the allegations of plaintiff's place of business and place of incorporation.

2. He admits the allegations of defendant's citizenship and residence.

3. He admits the allegation of jurisdiction under Section 4915 R. S. (35 U. S. C. A. 63).

4. He has no information as to plaintiff's allegations of invention and the non-existence of statutory bars except

as informed by paragraph 4 and plaintiff's application for letters patent No. 50,477.

5. He admits that on the 15th day of August, 1925, William Luxmore filed an application for letters patent for improvements in waterproof and oil-proof flexible abrader, to which application Serial No. 50,477 was given.

6. He admits that the said application contains claims 25 to 30, inclusive, recited in paragraph 6. These claims are held to be unpatentable over the following prior patents:

7 Graft, 1,217,593, Feb. 27, 1917;
Carlton, 1,775,631, Sept. 16, 1930.

Profert of copies of said patents is hereby made. The claims are also held to be unpatentable to plaintiff in view of Interference No. 58,727, in which the application herein was involved and in which a decision adverse to the applicant William Luxmore was rendered.

7. He admits for the purpose of this suit the allegations of ownership and assignment.

8. He admits that the primary examiner finally rejected the claims set out in paragraph 6, that appeal was taken to the Board of Appeals and that the Board of Appeals on July 1, 1932, rendered a decision affirming the decision of the primary examiner, and that no appeal to the United States Court of Customs and Patent Appeals has been taken by plaintiff.

9. He admits the statement in paragraph 9 is in conformity with Section 4915 R. S.

10. He admits plaintiff has been refused a patent and denies that plaintiff is lawfully entitled thereto as more fully appears from the statement of the examiner and the decision of the Board of Appeals, copies of which will be presented at the hearing.

Further answering defendant denies each and every allegation of the Bill of Complaint not herein specifically and sufficiently denied or admitted, and prays that plaintiff's Bill of Complaint be dismissed.

Wherefore defendant having fully answered the Bill of Complaint denies that plaintiff is entitled to the relief demanded or any part thereof and prays that he be hence dis-

missed with all costs of the proceedings against the
8 plaintiff as provided in Section 4915 R. S.

THOMAS E. ROBERTSON,
Commissioner of Patents, Defendant.

T. A. HOSTETLER,
Solicitor of the U. S. Patent Office,
Attorney for Defendant.

DISTRICT OF COLUMBIA,
City of Washington, ss:

I, Thomas E. Robertson, Commissioner of Patents, depose and say that I have read the above answer by me subscribed and know the contents thereof, and that the statements of facts therein made as upon personal knowledge are true, and those made upon information and belief I believe to be true.

THOMAS E. ROBERTSON,
Commissioner of Patents.

Subscribed and sworn to before me this 10th day of January, 1933.

[SEAL.] ALBERT W. KAISER,
Notary Public, D. C.

My commission expires April 6, 1933.

Memorandum.

September 18, 1933.—Conway P. Coe substituted in place and stead of Thomas E. Robertson, as Commissioner of Patents.

9 *Memorandum of Court.*

Filed April 1, 1935.

* * * * * * *

I agree with the conclusions reached by the tribunals of the Patent Office.

The bill will be dismissed with costs.

BAILEY, *J.*

Final Decree.

Filed June 26, 1935.

* * * * * * *

This cause having come on to be heard and having been tried in open court and argued by counsel for the respective parties upon the pleadings and proofs adduced and submitted to the Court,

It is Adjudged, Ordered and Decreed this 26th day of June, 1935, that the Bill of Complaint in this case be, and the same hereby is dismissed with costs against the plaintiff.

JENNINGS BAILEY,
Justice.

From the foregoing decree the plaintiff, Minnesota Mining and Manufacturing Company, in open court on the date named above, notes an appeal to the United States Court of Appeals for the District of Columbia, and the Court fixes the cost bond on said appeal in the sum of $100, or in lieu thereof the sum of $50 in cash to be deposited with the Clerk of this Court.

JENNINGS BAILEY,
Justice.

10

Memoranda.

July 12, 1935.—$50 deposited in lieu of bond on appeal.

July 16, 1935.—Time to file Statement of Evidence extended to and including August 8, 1935.

Assignment of Errors.

Filed August 7, 1935.

* * * * * * *

The Court erred—

1. In holding the claims involved in suit unpatentable over the patents to Graft 1217,593 and Carlton 1775,631;
2. In adopting the decision and conclusions reached by the Board of Appeals;
3. In agreeing with the conclusions reached by the Tribunals of the Patent Office;

4. In holding Plaintiff is not entitled to a decree for the claims involved in the suit;
5. In dismissing the Bill of Complaint.

H H BENJAMIN,
Solicitor for Plaintiff.

Of Counsel:
PAUL CARPENTER.
J. T. BASSECHES.

Service accepted Aug. 3, 1935.

R. F. WHITEHEAD,
Solicitor for Defendant.

11 Supreme Court of the District of Columbia.

Wednesday, August 7, 1935.

The Court resumes its session pursuant to adjournment, Mr. Justice Letts, presiding.

* * * * * * *

Come now the parties hereto by their respective attorneys of record, and thereupon, the plaintiff by its attorney presents to the Court its Statement of Evidence taken at the trial of this cause, and prays that the same be signed and made of record, nunc pro tunc, which is hereby acordingly done.

Designation of Record.

Filed July 27, 1935.

* * * * * * *

Now comes Minnesota Mining & Manufacturing Company, Inc., the appellant in the above entitled cause, and designates parts of the record which it desires to have included in the transcript, such parts being considered sufficient for the determination of the questions raised on appeal, namely:

1. Bill of Complaint;
2. Answer;
3. Plaintiff's Exhibit No. 1—certified copy of file, wrapper of Luxmore application, Serial No. 50,477, Filed August 15, 1925;

4. Defendant's Exhibit No. 1—United States patent to Carlton, 1,775,631, September 16, 1930;

5. Plaintiff's Exhibit No. 2—United States patent to Klingspor, 1,833,715, Nov. 24, 1931;

6. United States patent to Graft, 1,217,593, Feb. 27, 1917;

7. Examiner's Statement before the Board of Appeals, February 1, 1932;

12 8. Decision of the Board of Appeals dated July 1, 1932;

9. Statement of evidence;

10. Copy of decision;

11. Copy of final decree;

12. Memo of $50 deposit in lieu of bond;

13. Assignments of Error;
together with a copy of this designation.

H H BENJAMIN,
Solicitor for Plaintiff.

Of Counsel:
PAUL CARPENTER.
J. T. BASSECHES.

Service accepted July —, 1935.

R. F. WHITEHEAD,
Solicitor for Defendant.

13 Supreme Court of the District of Columbia.

UNITED STATES OF AMERICA,
District of Columbia, ss:

I, Frank E. Cunningham, Clerk of the Supreme Court of the District of Columbia, hereby certify the foregoing pages numbered from 1 to 12, both inclusive, to be a true and correct transcript of the record, according to directions of counsel herein filed, copy of which is made part of this transcript, in cause No. 55194 in Equity, wherein Minnesota Mining and Manufacturing Company, is Plaintiff and Thomas E. Robertson, Commissioner of Patents, is Defendant, as the same remains upon the files and of record in said Court.

In testimony whereof, I hereunto subscribe my name and affix the seal of said Court, at the City of Washington, in said District, this 17th day of October, 1935.

[Seal Supreme Court of the District of Columbia.]

FRANK E. CUNNINGHAM,
Clerk.
By CHAS. D. COFLIN,
Assistant Clerk.

14 In the Supreme Court of the District of Columbia, Holding Equity Court.

In Equity.

No. 55,194.

MINNESOTA MINING AND MANUFACTURING COMPANY, INC., 791 Forest Street, St. Paul, Minn., Plaintiff,

vs.

CONWAY P. COE, Commissioner of Patents, Defendant.

Statement of Evidence.

At the hearing of the above entitled cause on Tuesday, March 21, 1935, before Mr. Justice Bailey, the following proceedings were had, evidence offered and given, rulings made by the Court, and exceptions taken by the plaintiff and noted by the Court.

Thereupon, to maintain the issues on their part joined, plaintiff offered in evidence:

Mr. Basseches: I offer in evidence as Plaintiff's exhibit No. 1 the application file of the Luxmore application, Serial No. 50,477.

Mr. Hostetler: I offer in evidence as defendant's exhibit No. 1, United States Patent to Carlton, 1,775,631, dated September 16, 1930.

George Barsky.

George Barsky, a witness called for and on behalf of the plaintiff, being then and there duly sworn by the Clerk of the Court, upon examination, testified as follows:

15 Direct examination.

By Mr. Basseches:

I live at 333 East Forty First Street, New York City. By occupation I am a chemist and chemical engineer.

My experience and training in the field of chemistry is as follows:

I received the following degrees from Columbia University: Bachelor of Science, 1916; Chemical Engineer, 1918; Master of Arts, 1922; Doctor of Philosophy, 1922. I was research chemist in the department of chemistry of Columbia University 1917-1918. I held the Bridgham Fellowship for engineering research 1919 and 1921. In 1922 I was employed by the American Cyanamid Co. as research chemist. In 1926 I was made Director of Research. In 1933 I was Chief Technologist. I left in August, 1933, and have my own office and laboratory in New York City as consulting chemist and chemical engineer.

During the time of my employment by the Cyanamid Co. I was engaged on various chemical, heavy chemical and metallurgical products and also on synthetic resins of the urea-formaldehyde type, of the glycerol phthalate type and of the phenol-formaldehyde type, and also the application of those resinous materials to various uses, including coating compositions.

I also worked with nitro cellulose coating compositions and solvents for said products. In my own work since leaving the Cyanamid Co. I have been working steadily on synthetic resins of various types.

I have testified in several interferences:

Whitworth versus Derby and Cunningham;
Cooper vs. Hubbell.

16 I have testified in the Southern District of New York in the case of Rubin and Mallory versus Aerovox.

In the last eight years my work has been largely in the field of synthetic resins.

I have had occasion to consider the file of the Luxmore Application, Serial No. 50,477, filed August 15 1925, for Waterproof and Oilproof Flexible Abrasive Material. The general nature of the invention involved in this application is as follows: Luxmore provides a flexible backing. He gives that a coat which we call a pre-size coat of the phenol formaldehyde resin. He allows this coat to dry, that is, to partially set, and then imposes on it a thicker coat of the same resinous material. While this thicker coat, or binder coat, is still adhesive, he distributes abrasive particles which become embedded in this binder coat. Subsequently the whole sheet is cured by the application of heat. That, in brief, is the process as Luxmore gives it, for the production of flexible waterproof abrasive paper.

The various layers which I have referred to may be superimposed on the backing material in another way. Of course, after the sizing coat is on the paper, the paper could be then cured, that is, the size coat could be brought to its final stage by heating and subsequently the bonding coat could be put on.

To describe the general nature of the synthetic resinous materials referred to by Luxmore, I may refer to three general types of coating materials which we recognize. One type which, for example, is represented by linseed oil or linseed oil varnishes, dries to a film by the absorption of oxygen from the air. The liquid picks up oxygen from the air and dries to a firm final film.

17 The second type is the nitro cellulose lacquer. Collodion is mentioned by Graft. Such films dry solely by the evaporation of solvents. The solution is spread out on the surface and the solvent evaporates into the air and leaves this residuum as a film.

The third type is the synthetic resin type; for example, Bakelite. These materials have the property of becoming infusible and insoluble upon the application of heat alone. That is, they have a resisting stage and can be subsequently heated. They contain, in themeslves, all the necessary working ingredients to be transformed to a final insoluble material A simple analogy would be the boiling of an egg. If you take a raw egg and subject it to heat by boiling it in water, it will be transformed into a new material—a hardened, solid material.

So, in the abrasive paper of Carlton and in the abrasive paper of Luxmore, you have as the binding material this firm, reactive resin—this resin which, solely by the application of heat, will be transformed into an infusible, insoluble body.

The effect produced in partially drying or setting the sizing coat upon the backing material, as described by Luxmore, at the intermediate stage of partially setting or drying the paper with the sizing coat, is to get a penetration into the fibre of this resinous material and a surface film on the outside, a very thin film.

By the Court: May I ask the kind of material that is used in the paste or glue which you use to patch down patches on inner tubes.

18 Dr. Barsky: That is usually a rubber cement. There are two kinds of sticky material that come out of a tube. It is a rubber solution. You rub that on the patch and the solvent evaporates. You allow evaporation of the solvent, and ordinarily, when you glue two pieces of wood together, for example, you have the glue on each surface, and allow part of the evaporation to take place and then put the two pieces together.

For example, if you took unsized paper and put the binder coat on it and put the abrasive material on top of that and then cured it, the paper would draw the binder coat—the binder material—away from the abrasive. It would rob the abrasive of the binder. In addition to that, there would be another effect. There would be the impregnation of the paper to a very full extent, that is, the paper would keep on drawing the binder until it was saturated. So, when you ended up with the final sheet, using no sizing material, you would have a very stiff paper and a poor bond of the abrasive to the paper due to the fact that the paper had robbed the abrasive. Presizing of the paper prevents that. That adjustment prevents the binding coat from escaping and going into the paper. In other words, by that sizing you accomplish two things: you get the binder where you want it, and you prevent the paper from getting too much resin and becoming brittle.

An explanation of the effect of heat on the synthetic resinous materials referred to by Luxmore is that heat renders these materials, as we say, insoluble and infusible. It cures them. It puts them in their final shape—final condition, in which they are water proof and will resist the action of oil as well.

19 I have had occasion to refer to the patents to Carlton 1775,631 and Graft 1217,593, referred to in the

record of the Luxmore application. The patent to Graft, in the employment of his method for the production of sandpaper, takes a backing material, dips the backing material into a solution of cellulose ester, such as Collodion, dries, applies a second coat of cellulose ester and then, to that, applies the abrasive material. Following this, the entire sheet is dried. The effect of drying the first coat that Graft applies to his paper is to bring the nitro cellulose film to its final state.

Graft, after applying the first coat on his backing material, dries and evaporates off all the solvent. After evaporating off all the solvent, Graft then applies a second coat of the same material. If Graft's second coat or binder coat were applied to his first coat while in the partially dry or set condition, there would be residual solvents left in the paper and on applying the second coat, you would have a condition where the solvent on the inside has to come out. It can only come out with difficulty and will cause a distortion or blistering in the composite sheet similar to lacquering something with nitro cellulose. Before putting on the second coat, you must be sure that the first coat is thoroughly dry; otherwise you get wrinkling and blistering.

I have had occasion to consider the Klingspor patent, No. 1,833,715, Nov. 24, 1931.

By Mr. Basseches: I offer in evidence, as Plaintiff's Exhibit No. 2, the Klingspor United States Patent No. 1,833,712.

Dr. Barsky: The patent to Klingspor, page 1, lines 72 to 83, that portion beginning with line 75, reads—

20
> "If paper is used as a base, it is preferably previously impregnated with linseed oil and dried."

The effect of applying the coat of binder material for the abrasive with that oil film in the partially dried or partially set condition would be that the film of linseed oil on the top of the paper would be soft and would tear away. On using such abrasive material, you would just pull out the abrasive and bond away from the paper.

My general knowledge of the treatment employed in applying automobile finishes by an oil paint is that by the old method of painting automobiles—the old time carriage painting method—twelve to fourteen coats were applied.

These were usually oil varnishes and each coat had to be thoroughly dried before the next coat was applied. This was very important because if an undercoat was not thoroughly dried, it would be soft. A subsequent coat would be on a soft backing and that would give, and you would get, an "orange peel" and effects of a similar nature. You would get defective painting jobs. Similarly, with nitro cellulose lacquer, it is necessary to dry each coat before applying the next or else you would run into trouble. You will get blistering, distortion of the film, unevenness.

The Court: Anyone who has ever tried to varnish anything has had that trouble.

Dr. Barsky: I have had my attention called to a statement in the file of this case, appearing in the Examiner's Statement, page 1, the last two lines, which reads as follows:

21 "It would seem to be obvious that an adhesive would more readily adhere to a soft tacky surface of the first coating than it would to a hard, smooth surface formed by thoroughly drying the first coating."

My opinion, in so far as obtaining better adhesion between the binder coat and the backing is concerned, and my opinion as to the conclusion drawn by the Examiner, is that if I wanted to get the best bond between the binding coat and the paper I would do as Carlton did: put the bonding coat right on the paper.

I have had occasion to examine the patent to Carlton 1,775,631 and Carlton says, as to the method for applying his binder coat to the backing, specifically calling attention to page 4, lines 18 to 31, that he applies his resinous binder to the back and then applies the abrasive material. Carlton goes on to say in line 17 of page 4—

"In case the back of the base has not been theretofore waterproofed, or if the relative thickness of the paper renders it desirable to compensate for any starving of the bond between the binder and the base which might occur through the penetration of the binder into the base beyond a desired extent, or if the relatively larger size of the grit renders such a step desirable in order to compensate for any deficiency in the bonding coat, an auxiliary coat or coats may now be applied, either to the back of the sheet opposite to the grit bearing surface, or to such grit bearing surface, or to both.''

In other words, Carlton realized or ran into this difficulty when he made abrasive paper of this nature. Two
22 things occurred, there was a starving of the binder coat by the paper and a weakening of the bond and he attempted to solve that difficulty, as he said, by applying what we might call a sand-size coat.

He also noticed the difficulties with the waterproofing and he said, ''Well, I will apply a back size coat for waterproofing.''

Now Luxmore, by his particular scheme, by the presize coating, treating it in just such a particular fashion and then applying a binder coat, has succeeded in keeping the binder material where it should be, at the same time having enough resin in the paper itself for waterproofing. If the paper size coat was cured to its final condition and then the binder coat applied and cured to its final condition, with the materials disclosed by Luxmore and Carlton, the effect upon the sizing coat and the general condition of the deposit would be that completely curing the size coat before applying the bonding coat is not effective. That is, if you completely cure the pre-sizing coat and then apply the bonding coat, abrasive and further cure, you get reduced flexibility over Luxmore and you get reduced bonding over Luxmore. In other words, Luxmore's process of carrying out the presize coat, so far, is better than curing the presize coat completely before applying the bonding coat.

The presize coat will get two cures. It will get the curing effect of the first application under these conditions, as well as the curing effect of the bonding coat.

I do not find anything in Carlton or Graft covering that special procedure of Luxmore which Luxmore has borrowed from Carlton or Graft in order to practice his particular process of partially setting or drying his paper sizing coat. If the procedure of Graft for drying his material—presized material and the binder coat—and the procedure of
23 Carlton of drying his binder coat were employed, you would get decreased flexibility if you completely cured the presize and then put the bonding coat on a completely cured, finished sheet again, that is, it would be analogous to the procedure of Graft of curing the sizing

coat and then putting the bonding coat on and then curing again.

From my knowledge of working with collodion preparations, such as shown by Graft, and from my knowledge of the use of linseed oil or the drying oil sizing coat shown by Klingspor, if I took Graft's material and applied the Luxmore procedure, I would run into trouble because the undercoat or sizing coat would be still soft and would still retain solvents and I would get distortion, wrinkling and so on—possibly, blistering in the binder coat. If I take linseed oil, a presize coat, and allow it partially to set and then apply a subsequent binding coat, that presized film will be soft and will not have any strength. It will tend to pull away from the paper and in addition to that, the coat above it will dry in a wrinkled condition—in a distorted condition.

From my knowledge and experience with the varnishes and paints and such materials to which I have referred as working with in connection with my qualifications, I would not consider it obvious at all to leave the presizing coat in a partially set or partially dried condition, as referred to by Luxmore. I think my tendency would be to completely cure the undercoat. If I wanted to size the coat so that the next coat would not penetrate the paper, I would cure the undercoat completely.

I am in no way associated with the Minnesota Mining & Manufacturing Co. or do not have any interest in the outcome of this suit.

24 Cross-examination.

By Mr. Hostetler:

Dr. George Barsky: I am familiar in a general way with the counts of that interference that was referred to—Luxmore, Klingspor and Carlton—and have read it.

In considering how many coats were contemplated in the counts of the interference, taking the Carlton patent, claims 1, 2, 3, 6 and 7, which were stated constituted the issue of that interference, in these five claims, as I see them, I see only one coating. He (Carlton) speaks of a bond.

(The following occurs in the record:)

"X Q. 3. Take any of the claims. Take the first one. '1. The new article of manufacture, flexible sandpaper which includes a backing'—that would mean the paper or cloth—'a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state.'

If I were manufacturing that article, instead of putting one coat of the bonding material on there, or two or three or four or any number, would it not be a bond that would unite the grit to the backing?

Mr. Basseches: I do not know how Mr. Hostetler intends that: that Dr. Barsky shall interpret the scope of the claim?

Mr. Hostetler: That is all right. I thought that Doctor Barsky had testified in various interferences——

The Witness (interposing): Would you like me to answer whether or not a man using several coats of Carlton's material—Is that it?

Mr. Hostetler: I asked the question, and I leave it to the witness and to Mr. Basseches whether he should answer it or not.

25 Mr. Basseches: Your Honor, I think he is asking Dr. Barsky to interpret the scope of the claim. I will admit that the claim would cover that group of coatings. We are the owners of the Carlton patent and certainly would hold any infringers who use *use* any number of coats under that claim.

The Witness: I would answer it, yes, it would infringe.

The Court: Well, he has answered, "yes."

Dr. Barsky: In painting a new house, lumber, or a board of any kind, the purpose of the priming coat is to seal up the lumber—to seal up the lumber with a priming coat and then put your paint coats on top of that. You would get better adhesion of your paint to the priming coat than you would to the wood. It is correct that this is to close up the pores of the wood so as not to require so much paint. It is correct that it is the same purpose in sizing before paint is applied.

In being referred to the Carlton patent, page 4, beginning line 17, in which he refers to the coating and in line 25 where he says "or if the relatively larger size of the grit renders such a step desirable in order to compensate for any deficiency in the bonding coat, an auxiliary coat or coats may now be applied, either to the back of the sheet opposite to the grit-bearing surface or to such grit-bearing surface, or to both'', it is true that Carlton contemplates using one or more layers of this material. He states here that he may put a coating of bonding material on after the grit is in place and he mentions that because he realizes that the unsized paper backing would rob the binder coat or rob the abrasive of the binder coat, that is, Carlton's second coat is put on after the bonding coat is on and after the abrasive is on.

26 The purpose of our process or, rather, the Plaintiff's process, of allowing the first coat to partially dry before applying the second coat is to get a satisfactory sandpaper. The general purpose of proceeding along that line is to get a flexible, waterproof sandpaper.

I think I can explain the effect of not permitting it to dry enough. There is a piece of paper which is very porous. If you put a bonding coat on—a heavy bonding—it would go under that paper and be drawn down by capillary attraction. Luxmore has found this. He takes his piece of paper. He puts on a sizing coat, which sizing coat goes through the voids in the paper and sizes those fibres. If you do not allow the presizing effect to take place, you would have the same thing as putting the heavy bonding coat right on top of the unsized paper.

Mr. Hostetler's theory is correct that where, some time ago he used white paint on a new board, what appeared to him to happen was that the oil soaked into the board and the white lead remained on top. That is the same kind of thing that happens when you put the heavy bonding coat on the unsized paper. The white lead—that is, the solid particles, stay on top and the resin or oil, in Mr. Hostetler's case, stayed in between. The unsized board has robbed the paint of the oil. Mr. Hostetler should have put on a priming coat. It is true that that is something which is known to every painter but this involves many different effects from just painting the board. In other words, here we have not solely a surface layer but we have in the paper all these fibres. In the paper, this is coated with a very thin film of synthetic resins so if we take an ordinary paper fibre and let it get wet, it loses its strength. By this sizing process we have coated these fibres of paper with a waterproof film.

27 If we were to take a sheet of very porous paper, such as a blotter, and we wanted to coat it to make it

waterproof and also to preserve its flexibility and if, as Mr. Hostetler supposes, a thick coat of paint were put on, it would soak through and the thing would become stiff after it was dry.

If you put on a thick coat of paint, you would run into a lot of trouble. Eventually the oil of the paint would run into the paper. If Mr. Hostetler were to put on a very thin sizing coat and let it dry and then put on a second sizing coat, he would save material if he dried the first sizing coat thoroughly before putting on the second one.

Going back to our process, the effect of permitting the first coat to become too dry before you applied the second would be to give you a more brittle paper.

In considering the three elements of all of these papers, the backing, the grit and the bonding material, there must be a relationship between the thickness of the bonding material and the size of the grit particles. If you had grit consisting of very large particles and another type which were very small particles, the relative thickness of the bonding material would be that with the large particles of grit you have to use deep layers of bonding material. For example, if the grit were, say, six millimeters in length, you could not hold it with a one millimeter layer of bonding material. The bonding material would have to come up higher. Where you use large sized or heavy abrasives, you would have to use heavier backing.

In referring to the Carlton patent, page 2, the last paragraph on that page, line 125, which says—

> ‘‘The amount of binder to be applied to the base varies according to several variable factors. Among these are (a) the thickness of the base, (b) the fineness or coarseness of the grit or layer of abrasive particles to be applied
> 28 to the base’’,

my statement agrees with the ‘‘(b)’’ part of the specification.

In referring to page 3 (Carlton), the first full paragraph beginning about line 8:

> ‘‘I have found in practice that the number of coats of the binder may also beneficially be varied according to (a) the thickness of the base, (b) the size of the grit, (c) the contemplated use of the abrasive article, and (d) whether the

grit be incorporated in the binder before application of the binder to the base, or whether the grit be applied to the binder after such binder has been applied to the base.'',

this specification contemplates the use of a plurality of layers of this coat of bonding material.

If asked whether I have any reason to assume that in applying a plurality of coats he (Carlton) contemplates letting them dry completely or putting them on fresh one after another or letting them dry partly, I would say that he does not say anything about that at all.

Redirect examination.

By Mr. Basseches:

Dr. George Barsky: Where Carlton, at the portions of the specification called to my attention by Mr. Hostetler on page 3, lines 7 to 15, refers to the number of coats or quantity of coats, I would say, from my experience, that it would be expected to dry each coat before the next succeeding coat is put on, in accordance with the nature of the material. I would say that from a reading of Carlton, the obvious thing would be to follow the usual practice of drying one coat before putting on the next succeeding coat.

29 Where Mr. Hostetler has referred to the board that he painted and on which he put a priming coat and he said that some of the oil was absorbed in some of the board, the relative stiffness of the board is not a factor in these cases, or is not to be considered as a factor as I do not care how stiff the board is in the house wall. In putting on priming coats, the priming coats would be thoroughly dried. That is the same practice as was followed in painting automobile bodies in the old days.

Recross-examination.

By Mr. Hostetler:

Dr. George Barsky: Phenol formaldehyde has another name. It is often called Bakelite.

Be it further remembered that the foregoing contains the substance of all the evidence given on the hearing of this cause, and each of the exceptions stated to have been taken by the attorney for the plaintiff were so taken and were duly allowed and noted by the Court, and in order that each and every thereof may be preserved and made of record this statement of evidence is duly stated, approved and signed, and ordered to be made of record in the above entitled cause this 7th day of August, 1935.

By the Court.

F. DICKINSON LETTS,
Justice.

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DEPARTMENT OF COMMERCE

UNITED STATES PATENT OFFICE

Plaintiff exhibit 1

[illegible] persons to whom these presents shall come, Greeting:

THIS IS T[illegible]ERTIFY that the annexed is a true copy from the records [illegible]is office of the File Wrapper and Contents, in the matt[illegible]f the

Pending Application of

William Luxmore,

F[illegible] August 15, 1925, Serial Number 50,477,

for

[illegible]mprovement in Water-Proof and Oil-Proof Flexible Abrader.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the City of Washington, this fourth day of March, in the year of our Lord one thousand nine hundred and thirty-five and of the Independence of the United States of America the one hundred and fifty-ninth.

ATTE[illegible]

Chief of Division.

Conway P. Coe

Commissioner of Patents.

11—6838
U.S. GOVERNMENT PRINTING OFFICE: 1934

TELEPHONE HARRISON 3638

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CLIFFORD C. BRADBURY
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PATENT AND TRADE-MARK LAW
1315 MONADNOCK BLOCK
CHICAGO

20

REC'D
AUG 15 1925
C.C. U.S. PAT. OFFICE

August 13, 1925.

Hon. Commissioner of Patents,
Washington,
D. C.

RE: William Luxmore - Case 13

Sir:

We are sending you herewith the application papers of William Luxmore for improvements in Water Proof and Oil Proof Flexible Abraders (Case 13). There is no drawing.

We also enclose our check for $20.00 to cover the first government fee.

Yours very truly,

Williams, Bradbury, McCaleb & Hinkle

Encs.

50277

R

ORIGINAL FILE WITH)
CONTENTS HEREIN)

COPY

NUMBER (Series of 1925)

50477

PATENT NO. 1931

DATED

DIV. 58

(EX'R'S BOOK) I-04-0

RS613

Name WILLIAM LUXMORE

ASSOR BY DIRECT AND MESNE ASSIGNMENTS TO MINNESOTA MINING AND MANUFACTURING COMPANY of ST PAUL, MINN., A CORP OF MINNESOTA.

of CHICAGO

State of ILLINOIS

Invention WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER

ORIGINAL		RENEWED
APPLICATION FILED COMPLETE	AUG 15, ~~19xx~~ 1925	
PARTS OF APPLICATION FILED: *Petition, Specification, Oath, First Fee $25,* ONE *sheets Drawings,*	AUG 15, ~~19xx~~ 1925	

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.... *Exr. Div.*

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.... *Exr. Div.*

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By Commissioner.

Notice of Allowance ...., 193
By Commissioner.

Final Fee ...., 193

Final Fee ...., 193

Attorney ~~WILLIAMS, BRADBURY, McCALEB AND HINKLE, 1315 MONADNOCK BLOCK~~
PAUL CARPENTER, ~~34 EAST JACKSON BOULEVARD~~
160 North LaSalle Street, CHICAGO, Illinois

Associate Attorney ~~E.S. WOLFE, Washington Loan & Trust Building, City.~~

No. of Claims Allowed .... *Print Claims* .... *in O. G.* *Class* ....

Title as Allowed ....

Division of App., No. ...., *filed* ...., *19*........

11—6820

50477

MAIL ROOM
AUG 15 1925
U.S. PATENT OFFICE

TO THE COMMISSIONER OF PATENTS:

Your petitioner, WILLIAM LUXMORE, a citizen of the United States, and resident of Chicago, in the County of Cook, and State of Illinois, whose post office address is 25 East Washington Street, Chicago, Illinois, prays that Letters Patent may be granted to him for the improvement in WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER (Case 13), set forth in the annexed specification, and he hereby appoints WILLIAMS, BRADBURY, McCALEB & HINKLE (Reg. No. 10,473), a co-partnership composed of Lynn A. Williams, Clifford C. Bradbury, Albert G. McCaleb, Ross O. Hinkle, and Albin C. Ahlberg, of 1315 Monadnock Block, Chicago, Illinois, his attorneys, with full power of revocation and substitution, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

SIGNED at Chicago, in the County of Cook and State of Illinois, this 12th day of August 1925.

William Luxmore

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TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM LUXMORE, a citizen of the United States, and resident of Chicago, in the County of Cook and State of Illinois, have invented a certain new and useful improvement in WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER, of which the following is a full, clear, concise, and exact description.

My invention is concerned with the provision of a flexible abrader which is impervious to and unaffected by water or oil coming into contact with its abradant-carrying surfaces or any cut, broken or torn portions thereof, which is quite flexible and capable of retaining its granular abrading material under flexure, and which employs as its water and oil proofing agent a material which is an extremely effective holder or binder for the abradant employed.

In making the abrader in the form of a sheet, I select a piece (usually a sheet or strip) of suitable material, for example, paper, of suitable weight and quality, and cause the same to absorb, preferably to the limit of its capacity for such absorption, ~~a Bakelite varnish of the kind now commonly known~~ under the trade name of ~~as~~ "Flexible Bakelite Varnish" The latter is ~~same being~~ a phenolic condensation product maintained in a flexible state, under all temperatures to which it is subjected in the manufacture and use of my sheet abrasive, by suitable non-volatile solvents

[illegible] A'

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Er.A or other miscible ingredients of like nature. I have obtained excellent results by using the varnish selling under the trade name ~~so-called~~ "No. 212-W Flexible Bakelite Varnish" manufactured and furnished by the Bakelite Corporation. This first treatment of the sheet with the said varnish may be accomplished either by ① immersing the sheet in the varnish or by applying the varnish to the surfaces of the sheet with a brush or other suitable means. The flexible Bakelite varnish employed in this first treatment of the sheet, which properly may be called the "impregnating operation" is preferably quite thin and free flowing (being thinned if necessary by the addition of benzol and/or alcohol) so that it will readily penetrate the sheet thoroughly to saturate its fibres and to fill up the interstices of the same.

After the aforesaid impregnating operation has been accomplished the sheet is permitted partially to dry, —— say for about thirty minutes at room temperature.

The next step in the manufacture of the abrader ② is the application of a "binder" coat of the said flexible Bakelite varnish to one or both faces of the paper. The varnish employed for these "binder" coats, which is applied by a brush or otherwise, is preferably considerably thicker than that used for the impregnating operation, —— it being desirable that the varnish used for the said "binder" coats have approximately the consistency of commercial corn syrup.

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③ Before the said binder coats have been given an opportunity to set to any considerable extent, the comminuted abradant, usually sharp sand, granulated glass, emery or the like, of the desired degree of fineness, is evenly sprinkled over and into the binder coat or coats so as to become thoroughly anchored therein after the performance of the final or baking operation.

④ The final step in the process of manufacture is the baking of the impregnated, coated and sanded sheet in a moderate temperature oven. By way of illustration I will say that I have obtained excellent results by baking for approximately one hour at a temperature of approximately 150° F. However, I do not limit myself to any specific baking time or baking temperature.

The abrasive sheet just described is particularly characterized by the fact that its usefulness is in no way diminished by contact with water or oil, --- even when the water or oil is permitted to come into contact with cut or torn edges of the sheet, --- this being true because the flexible varnish, prior to baking, is permitted to penetrate the sheet to saturate all of its fibres and to occupy all of the interstices between the fibres.

By way of illustrating the water-proof characteristic of my improved abrader I will say that I have successfully used the same for long periods of time in the form of so-called "sandpaper discs" in dental work. These discs have retained their usefulness for long periods of time though used in the mouth, and oftentimes operating under a stream of water. The abrasive sheet as before stated, is also impervious to oil, --- a feature of great importance when it is employed for many industrial purposes.

It might be supposed that the baking operation seriously might affect the tensile strength of the finished product. This, however, is not the case because the added tensile strength, attributable to the flexible phenolic condensation product in and around the fibres of the sheet, more than offsets any decrease in tensile strength which may be attributed to the baking operation.

Substitute 73
[illegible]

Having thus described my improved abrader as well as an illustrative method of manufacturing the same what I claim is new and desire to secure by Letters Patent of the United States is:

Insert A3

Per A

Can Ped

2A. A flexible sheet abrasive impervious to water and oil, comprising a sheet impregnated and coated with ~~a varnish in the form of a phenolic condensation product of the kind which is maintained in a flexible state by non-volatile solvents or other miscible ingredients of like nature,~~ a flexible phenolic condensation product varnish and abrading material distributed over said sheet and retained thereon by the ~~varnish~~ condensation product aforesaid.

all not Can Ped

3A. A flexible sheet abrasive impervious to water and oil, comprising a sheet impregnated and coated with ~~flexible Bakelite~~ phenol-aldehyde resin varnish, and abrading material distributed over the face of the sheet and retained thereon by the ~~varnish~~ resin aforesaid.

Insert A4 & A5

Per A

"6 5 4"

Cont. Le Fr

6A. A flexible sheet-abrasive impervious to water and oil, comprising a sheet impregnated with ~~a varnish in the form of~~ a flexible phenolic condensation product varnish ~~of the kind which is maintained in a flexible state by non-volatile solvents or other miscible ingredients of like nature,~~ and abrading material distributed over said sheet and retained thereon by the ~~varnish~~ condensation product aforesaid.

Can Ped

7A. A flexible sheet abrasive impervious to water and oil, comprising a sheet coated with ~~a varnish in the form of~~ a flexible phenolic condensation product varnish ~~of the kind which is maintained in a flexible state by~~

Re A ~~non-volatile solvents or other miscible ingredients of like nature,~~ and abrading material distributed over said sheet and retained thereon by the condensation product ~~varnish~~ aforesaid.

" "

8A. A flexible sheet abrasive impervious to water and oil, comprising a sheet impregnated with flexible phenol-aldehyde resin ~~Bakelite~~ varnish and abrading material distributed over the face of the sheet and retained thereon by the resin ~~varnish~~ aforesaid.

" "

9A. A flexible sheet abrasive impervious to water and oil, comprising a sheet coated with flexible phenol-aldehyde resin ~~Bakelite~~ varnish and abrading material distributed over the face of the coated sheet and retained thereon by the resin ~~varnish~~ aforesaid.

Rej 70

Re A

10A. A flexible abrader impervious to water and oil, comprising a body coated with ~~a varnish in the form of~~ a flexible phenolic condensation product varnish ~~of the kind which is maintained in a flexible state by non-volatile solvents or other miscible ingredients of like nature,~~ and comminuted abrading material distributed over said coating and retained thereon by the condensation product ~~varnish~~ aforesaid.

Cancelled

Insert A6

12A. ~~An abrader comprising a flexible body~~ coated with a flexible phenolic condensation product in which commimuted abrasive material is embedded.

Cancelled

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6

13a ~~9.~~ ~~The method of~~ making a flexible abrading sheet impervious to water and oil, which consists in impregnating a sheet with a flexible ~~Bakelite~~ phenol-aldehyde resin varnish and applying a granular abrading material to a face of the sheet to be retained thereon by the ~~varnish~~ resin aforesaid.

Per A

14a ~~10.~~ The method of making an abrading sheet impervious to water and oil which consists in thoroughly impregnating a sheet with a relatively thin, flexible ~~Bakelite~~ phenol-aldehyde resin varnish, applying a relatively thick coat of said varnish to a face of the sheet, and applying a granular abradant to such coat to be retained by it.

Cancel

15a ~~11.~~ ~~The method of making an~~ abrading sheet impervious to water and oil, which consists in thoroughly impregnating a sheet with a relatively thin, flexible ~~Bakelite~~ phenol-aldehyde resin varnish, applying a coat of such varnish to a face of the sheet, applying a granular abradant to such coat to be retained by it, and then baking the sheet which has been thus treated with varnish and abradant as aforesaid.

16a ~~12.~~ ~~A method of making~~ an abrasive body which includes the coating of a surface of the body with a flexible condensation product and then embedd~~ed~~ing comminuted abrasive material therein.

Cancel

13. All the improvements and advantageous features, singly and in combination which are disclosed in either the specification or in the claims.

Per A

IN WITNESS WHEREOF, I hereunto subscribe my name this 12th day of August, 1925

William Luxmore

O A T H

STATE OF ILLINOIS)
)SS:
COUNTY OF C O O K)

WILLIAM LUXMORE, the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States, and resident of Chicago, in the County of Cook and State of Illinois, and that he verily believes himself to be the original first and sole inventor of the improvement in WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER, (Case 13) described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof, or patented or described in any printed publication in the United States of America or any foreign country before his invention or discovery thereof, or more than two years prior to this application, or in public use or on sale in the United States for more than two years prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said improvement has been filed by him or his representatives or assigns in any country foreign to the United States.

William Luxmore

SUBSCRIBED AND SWORN TO before me this 12th day of August 1925.

Hattie R. Schaake
Notary Public

50477

Div. 50 Room 322

Address only "The Commissioner of Patents, Washington, D. C." and not any official by name

I/R

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Paper No. 2

All communications respecting this application should give the serial number, date of filing, and name of the applicant

MAILED
FEB 11 1926

Please find below a communication from the EXAMINER in charge of this application

Thomas E. Robertson
Commissioner of Patents

Williams, Bradbury, McCaleb & Hinkle
1315 Monadnock Block,
Chicago, Ill.

Applicant: W. Luxmore,
Ser. No. 50,477
Filed Aug. 15, 1925
For Water-Proof and Oil-Proof Flexible Abrader.

References made of record:

Meyell,	27,817	Apr. 10, 1860	51-279
Graft,	750,639	Jan. 26, 1904	51-278
Gardner,	1,209,831	Dec. 26, 1916	"
McIntosh,	1,435,721	Nov. 14, 1922	"
Baekeland,	942,808	Dec. 7, 1909	"

Since "Bakelite" is a proprietary name its use in the specification and claims is objected to. Phenolic condensation product should be used.

No "non-volatile solvents or other miscible ingredients --" (see page 1, last line and page 2, line 1) are disclosed. The inference is that applicant has not invented such composition per se, but that such is on sale in the market. See page 2, lines 2 and 3.

The prior art shows the use of various binders to secure abrasive to a base. Meyell uses rubber, Graft uses celluloid cement, Gardner shows that shellac or rubber can be substituted for glue. Baekeland and McIntosh show the use of phenolic condensation product as a binder. In Baekeland page 2, lines 70-77 is described the application to a paper base of abrasive by the use of bakelite. That applicant uses a flexible bakelite varnish, old per se, is not indicative of invention, since it is obvious that an abrading sheet should be flexible and it would also be obvious to use a flexible bakelite binder if such were available in the market.

The claims are rejected.

The power of attorney will not be recognized until a 25¢ revenue stamp has been affixed thereto.

C. L. Bla

Examiner.

vm

50477 R

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON, D. C.

[illegible]

LETTER No.

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON, D. C.

Feb. 25, 1926.

In re: Application of
William Luxmore,
Filed Aug. 15, 1925,
Ser. No. 50,477,
Water-Proof and Oil-Proof
Flexible Abrader.

FOR CLASSIFICATION.

Classification Examiner,

Sir:

This case is submitted for proper classification. It was given the first action by Div. 50 because of the age of the case without having received any action, but all the art cited on the merits comes from Class 51. In addition thereto the following are analogous:

Bullock,	1,458,322	51-278
"	1,311,550	"
Beecher,	1,546,115	"
Martin,	1,567,071	"

No good reason is seen why this case was refused by Div. 29 unless it was due to the presence in Class 91 of the patent to

Isham,	5535	91-68 (E)

Respectfully submitted,
C. L. Black
Examiner.

50477
12

Assoc. Power of Atty #3
Clorin

APPLICATION U.S. PATENT OFFICE
JUN 25 1926

U.S. PATENT OFFICE
FILED
JUN 26 1926
DIVISION 50

UNITED STATES PATENT OFFICE

In re application of	
William Luxmore	
WATER PROOF AND OIL PROOF FLEXIBLE ABRADER	Before the Examiner Division 50 Room 322
Filed Aug, 15,1925	
Serial No.50,477	

Hon. Commissioner of Patents:
Washington, D.C.

Sir:

Please recognize L.S. WOLFE, Washington Loan and Trust Building, Washington D.C. as our associates in the above entitled case.

Respectfully

Williams, Bradbury, McCaleb & Hinkle

Attorneys.

4/a

IN THE UNITED STATES PATENT OFFICE

U. S. PATENT OFFICE
FILED
JUN 26 1926
DIVISION 5

In re application of
William Luxmore
WATER PROOF AND OIL PROOF
FLEXIBLE ABRADER
Filed Aug. 15, 1925
Serial No. 50,477

Before the Examiner
Division 50 Room 322

Hon. Commissioner of Patents,
Washington D.C.

Sir:

In the matter of the above entitled application and in response to the office action of February 11, 1926 the following amendment and remarks are submitted:

Page 1 line 5 from the bottom change " a Bakelite varnish------now commonly" to read a flexible phenol resin varnish for example such a one as now commonly

a'

Page 1 line 4 from the bottom change "as" to read under the trade name of; change the comma after " Varnish" to a period; change "the same being" to The latter is

Page 2 line 2 change "so-called" to varnish selling under the trade name

After page 4 line 13 insert the following paragraph:

a²

~~This invention is not restricted to the use of~~ flexible phenol -methylene resins such as "Bakelite" as impregnating and binding materials, but any flexible synthetic resinous or gummy composition may be used. Instead of carrying out the impregnating and coating as two separate steps, they can be combined into one by either -

Sub B'

c'

50477 14

using an excess of the varnish as an impregnator so that sufficient will be left as a coating to combine with the abrasive material or by using sufficient varnish as a coating so that it will also impregnate the sheet of backing material.

Claims 1,~~4~~ 3, and 7 lines 2 to 5 or 6 change " a varnish in the form-----------ingredients of like nature" to read a flexible phenolic condensation product varnish

Claims 2,5,6 and 9 line 3 and claims 10 and 11 line 4 change "Bakelite" to phenol-aldehyde resin

Claims 1,3,4 and 7 last line change "varnish" to condensation product

Claims 2,5,6 and 9 last line or next to last line change "varnish"to resin.

Claim 6 line 4 insert coated before "sheet"

Claim 12 line 3 change "embedded" to then embedding.

Claim 12 line 4 after "material" insert therein

Insert the following claim as claim 1:

a^3

Can Ent'd

1. A flexible sheet abrasive impervious to water and oil, comprising a sheet impregnated and coated with a flexible synthetic resinous varnish, and abrading material distributed over said sheet and retained thereon by the resinous material aforesaid.

Change the numerals of claims 1 and 2 to 2 and 3 respectively.

In ser t the following claim as claim 4:

a^4

Can Ent'd

4. A flexible sheet abrasive impervious to water and oil, as in claim 3 in which a flexible phenol-formaldehyde varnish is used for impregnating and coating.

In sert the following claim as claim 5:

a5 Canceled

5. A flexible sheet abrasive impervious to water and oil, comprising a sheet impregnated with a flexible synthetic resinous varnish, and abrading material distributed over said sheet and retained thereon by the resinous material aforesaid.

Change the numerals of claims 3 to 7 to 6, 7, 8, 9, and 10.

Insert the following claim as claim 11:

a6 Canceled

11. An abrader comprising a flexible body coated with a synthetic flexible resinous product in which comminuted abrasive material is embedded.

Change the numerals of claims 8 to 12 to 12, 13, 14, 15, and 16

Cancel claim 13.

Insert the following additional claims:

a7 Canc

17. An abrader comprising a flexible body thoroughly impregnated with a flexible binder.

Cand.

18. An abrader in which only the lower part of the abrading material is embedded in the binder, the abrading surface of said abrader being free of binder. said binder being a flexible synthetic resin.

48 Remarks.

A 25¢ revenue stamp is enclosed herewith.

The word "Bakelite" has been eliminated from the claims and where it is used in the specification it is capitalized and enclosed in quotation marks.

The rejection of the claims upon the references of record appears to be based upon the ground that there is no invention in substituting a flexible "Bakelite" binder for any other binder. This rejection is not sound because by such substitution the applicant has achieved new and unexpected results, and moreover a new method of applying the abrading material is disclosed in this application and is not disclosed in any of the references of record.

The following discussion of the pertinency of the references and of the special features of this invention were completely gone over in detail in an interview courteously granted by the Examiner in charge of this application.

The novel features of this invention which are not shown or disclosed in the references may be briefly summarized as follows:

(1) By impregnating and coating the supporting sheet with a initial resinous condensation product, such sheet is made an integral part of the abrader when the resin is later further condensed and hardened by baking in an oven. There is therefor- no tendency for the abrader and binder to pe*a*l from the supporting sheet, and when the edge of the sheet is torn or cut there is no very weak connection between the binder and the supporting sheet which oil or water can readily attack.

(2) a phenolic resin offers great advantages as 49 a binder over shellac, rubber, glue or celluloid. The phenolic resin can be maintained in the desired state of plasticity for any desired length of time by regulating the extent of the condensation reaction and then after embedding the abrasive material by heating in an oven the resinous material can be readily hardened to a firm, hard and coherent binder.

(3) The flexible resin offers many advantages over the previous rather brittle synthetic resins inasmuch due to its flexibility and elasticity it will retain the abrasive much more firmly and it will not so readily allow the abrasive

particles — break off when stress is put upon them, as would a brittle binder. It is therefor- only necessary to have comparatively a small part of the abrading particle embedded in the resinous binder. This in turn will lessen the amount of resinous binder which it is desired to use.

(4) Previously in making abrasives bound with a resinous binder it was customary to mix the abrasive material and the fluid resinous binder or the reaction product or mixture of the reagents going to make up the resinous binder and then add this mixture to the desired supporting material. This was due to the fact that the resin was brittle and practically all of the abrading particles had to be completely surrounded by the binder to prevent an abnormal breaking away of the abrasive particles when they would be used in processes of abrading. A flexible resin only requires that the lower parts of the abrading particles be embedded in a binder.

By using a flexible binder it is therefor- possible to first add the coating of binder and then add the powdered abrasive.

This also has the further advantage that the abrading surface of the abrasive is free of a coating of the
50 binder. This is especially desirable in the case of dental sandpaper discs where it would not be necessary to have a considerable amount of a finely powdered phenolic condensation product in the mouth. The phenolic condensation products always contain some free phenol and the finely divided particles heated up by the abrasion process due to such free phenol would have an injurious effect upon the membranes of the mouth.

All the claims are now drawn directed to one of more of the above novel features.

None of the references of record disclose an abrasive in which the abrading surface is free of binder. Baekeland and McIntosh mix the abrasive material with the initial condensation product or the reaction mixture of phenol and formaldehyde. The binder of Graft does not have the desirable properties of a flexible resin. Gardner causes the glue to penetrate into the spaces between the abrading particles by means of a damp heat so that the abrading surface will contain glue. Mayall mixes together his binder and sand before application to the supporting sheet.

None of the references disclose impregnating the supporting sheet with a binder so as to cause it to become integral with the binder for the abrasive.

None of the references disclose using a flexible phenol resin which gives new and unexpected results.

Allowance is respectfully requested.

Respectfully Submitted,
WILLIAM LUXMORE,
By L. S. WOLFE,
His Attorney.

Washington, D. C., June 24, 1926.

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON, D. C.

2—[illegible]

LETTER No. Sept. 7

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

September 8, 1926.

In re Application of :
William Laxmore :
Filed August 15, 1925 : CLASSIFICATION.
Serial No. 50,477 :
Water-Proof and Oil :
Proof Flexible Abrader :

Classification Examiner.

Sir:

Since the invention in the above case has been better brought out by the amendment and argument emphasizing the exposure of the grains as produced by first impregnating the sheet and then applying the grains instead of applying a mixture of grains and binder and by claims for the article. Division 29 is not now disposed to contest the assignment thereto of the above case, but it is submitted in connection with that of application 65,486, of Klein and Brown, to illustrate the limit to which it is thought assignment of processes for coating to Division 29, should be confined and the willingness of Division 29 to accept that line which may be broadly stated to be that (the process, or the article produced thereby must be improved in relation to facilitating the removal of material from a surface by friction with such product in order to constitute the product or process an improvement in the art of Abrading.)

Respectfully,

Examiner, Division 29.

50477
20

Div. 29 Room 160-Annex 260 H/AG Paper No. 5

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and not any official by name

DEPARTMENT OF COMMERCE
UNITED STAT. . PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant

November 23, 1926

Please find below a communication from the EXAMINER in charge of this application.

Thomas E. Robertson
Commissioner of Patents.

GPO 11—9623

L. S. Wolfe,
Washington Loan & Trust Bldg.
Washington, D. C.

Applicant: William Luxmore

Ser. No. 50,477
Filed August 15, 1925
For Water-Proof and Oil-Proof
Flexible Abrader.

MAILED
NOV 23 1926

In response to Amendment filed June 25, 1926

Additional references of record :

✓ Crupi	1,468,960	Sept. 25, 1923	(51-279)
✓ Okie	1,565,028	Dec. 8, 1925	(51-279)
✓ (Br.) ✓ Jackson	208,389	Dec. 20, 1923	(51-280)
✓ Baekeland	942,808	Dec. 7, 1909	(51-280)
✓ Matheson	1,309,581	July 8, 1919	(91-68)
✓ Edwards	157,068	Nov. 24, 1874	(91-18)

That part beginning with the word "Instead" in lines 4 and 5 of the statement inserted in line 13, page 4, is objected to, as not being warranted by the original disclosure set forth in the specification.

Claim 1 is rejected on the patent to Okie and the British patent No. 208,389, as well as on the patent to Edwards in view of the patents to Baekeland and Matheson. No invention being involved to substitute the resin or binder disclosed by Baekeland or Matheson for the resin employed by Edwards.

Claims 2, 3, 4, 6, 7, 10 and 12 are in substance the same, and are rejected on the patent to Baekeland, and to Crupi.

Claims 5, 11, 17 and 18 are rejected on the patent to Okie.

Claims 8 and 9 are in substance the same and are rejected on the patents to Matheson, Baekeland and Crupi.

Claims 13 to 16 inclusive are rejected on the patents to Okie, Baekeland, Crupi and the British Patent No. 208,389

Examiner.

50477

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JAN
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IN THE UNITED STATES PATENT OFFICE

U. S. PATENT OFFICE
JAN 20 1927
DIVISION 29

In re application of :
William Luxmore :
Serial No. 50,477 :
Filed August 15, 1925 :
Water-Proof and Oil-Proof :
Flexible Abrader :

Before the Examiner.
Room 160-annex Division 29

HON. COMMISSIONER OF PATENTS,
Washington, D. C.

Sir:

In the matter of the above-entitled application and in response to the office action of November 23, 1926 the following amendment and remarks are respectfully submitted:

Page 4, line 13, cancel the amendment and substitute, - This invention is not restricted to the use of flexible phenol-methylene resins such as "Bakelite" as impregnating and binding materials, but any flexible synthetic resinous or gummy composition may be used. -

D'

REMARKS

The patent to Edwards relates to the coating of paper with glue and the sprinkling of abradant over the sticky surface to form a sheet of abrading material. The

British patent to Jackson likewise discloses the use of glue or gelatine which is subsequently rendered insoluble by alum, formaldehyde etc. Oakie saturates his paper with gum and oil, as for example kauri, copal or dammar dissolved in a vehicle of linseed oil or China wood oil.

It is respectfully submitted that glue, gelatine, kauri, copal, and dammar, are not in any sense equivalents of bakelite, and failing to be equivalents cannot be substituted by bakelite without the exercise of invention. True, bakelite varnish in itself is not new, but applicant's use of this varnish is novel. The advantages derived from the use of bakelite in the manufacture of sheet abradants have been detailed in applicant's specification. It is unnecessary, therefore, to repeat those advantages here, but the Examiner's attention is again called to the specification for a statement of the advantages and new results of applicant's invention.

Claims 2, 3, 4, 6, 7, 10 and 12 have been rejected over the patents to Bakeland and Crupi, but it is respectfully submitted that neither of these patents shows the invention claimed. Crupi discloses the use of rosin and glue as a surface for retaining abradant. Applicant is unable to find that this patent discloses the coating and impregnating of a sheet with a "varnish in the form of a phenolic condensation product", or a "flexible Bakelite varnish", or "a flexible phenolic condensation product" as is variously recited in the claims rejected. Nor does the patent to Bakeland disclose the invention as is claimed. The finished article in this case is not in sheet form and the abradant is not "distributed over said sheet" as is claimed, but exists with the phenolic condensation product as a "thoroughly mixed mass" (see page 1, lines 51-52 of the patent).

Claims 5, 11 and 18 are rejected on Okie. The Examiner is requested to point out where in this patent he finds disclosed "a flexible synthetic resinous varnish" (claim 5), "a synthetic flexible resinous product" (claim 11), "a flexible synthetic resin" (claim 18).

Claim 17 recites "a flexible body thoroughly impregnated with a flexible binder". Okie specifically states, in page 1, lines 78 to 80, that the moisture-proofing agent penetrates "into the material to an extent short of exudation on an adjacent surface thereof". There is, clearly, no thorough impregnation here such as applicant contemplates.

Claims 8 and 9 are believed to be patentably distinct. Claim 8 recites a sheet "impregnated" with bakelite varnish while claim 9 recites a sheet "coated" with the synthetic resinous coating. The terms "impregnated" and "coated" are not synonymous. The patent to Matheson is for a fireproofing coating; it is unrelated to the art of sheet abrasives and is not pertinent in this case. The patents to Bakeland and Crupi have been discussed above, and clearly do not anticipate the claims rejected thereover. A further discussion of these references is, therefore, believed to be unnecessary.

Claims 13 to 16 are, likewise, not met by the references cited thereagainst, and a reconsideration of the rejection is accordingly requested.

The Examiner is requested, in accordance with the provisions of Rule 66 of the Rules of Practice, to point out specifically wherein the references which he relies upon meet the terms of the claims rejected, unless more pertinent art is found, or the claims are allowed.

In the course of the prosecution of this application the Examiner has cited the best art found on his search, but the patents cited all fail to disclose the invention here in issue. The holding that there is no invention in substituting bakelite for glue or gelatine to thereby build-up an anticipation of applicant's claims is not believed to be warranted and should be withdrawn. Bakelite is not the equivalent of glue or gelatine or copal; its characteristics and properties are distinctly different, and its use in preference to the old and well known binders and adhesives disclosed in the patents of record, in the manufacture of sheet abradants, produces new results. For this reason it is believed that the proposed combination of references is improper, and it is requested that the rejection be withdrawn and the claims allowed.

Respectfully submitted,
William Luxmore
By
Associate attorney.

Washington, D. C.
January 19, 1927.

Div. 29 Room 160 Annex. -260 Paper No. 7.

Address only "The Commissioner of Patents, Washington, D. C.," and not any official by name

HCH:MMT

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant

Please find below a communication from the EXAMINER in charge of this application.

Thomas E. Robertson
Commissioner of Patents.

GPO 11-8623

MAILED
MAY 5 1927

May 5, 1927.

Applicant: W. Luxmore,

L. S. Wolfe,
Washington Loan & Trust Bldg.
Washington, D. C.

Ser. No. 50,477,
Filed Aug. 15, 1925,
For Water-Proof and Oil-Proof Flexible Abrader.

Responsive to amendment filed Jan. 19, 1927.

Additional reference made of record:-

Hatch,	1,032,602,	July 16, 1912,	(51-280)

The patent to Crupi discloses a waterproof flexible sheet of abrasive which is impregnated and coated with a flexible synthetic resinous composition. Attention is called to the description in lines 18 to 30, page 2; lines 40 to 60, and lines 75 to 95, page 3, of the printed specification.

All applicant has done over the patent to Crupi is to substitute the specific resin or waterproofing composition disclosed by Baekeland, of record, for the resin or binder disclosed by Crupi.

Claim 1 is rejected on the references heretofore cited, as well as on the patent to Crupi.

Claims 2, 3, 4, 6, 7, 8, 9, 10, and 12 do not patentably differentiate and are rejected on the patent to Crupi in view of the patent to Baekeland.

Claims 5, 11, 17, and 18, which set forth a flexible body, impregnated with a flexible binder, are rejected on the patent to Crupi, of record, and the patent to Hatch.

Claims 13 to 16 inclusive are rejected on the patent to Crupi.

Examiner.

THIS ACTION MUST BE RESPONDED TO WITHIN SIX MONTHS.

MAIL ROOM
MAY 31 1927
U.S. PATENT OFFICE

8/6
1927

IN THE UNITED STATES PATENT OFFICE

In re application of William Luxmore Serial No. 50,477 Filed August 15, 1925 Water-Proof and Oil-Proof Flexible Abrader	Before the Examiner. Room 160-Annex Division 29

HON. COMMISSIONER OF PATENTS,
Washington, D. C.

Sir:

In the matter of the above-entitled application and in response to the Office action of May 5, 1927 the following amendment and remarks are respectfully submitted:

Cancel claim 17.

REMARKS

The patent to Crupi has been chiefly relied upon by the Examiner in rejecting the claims. It is submitted, however, that Crupi does not disclose "a flexible synthetic resinous varnish", "a varnish in the form of a phenolic condensation product", or a "flexible Bakelite varnish" as is variously recited in the claims rejected. Phenolic condensation product (Bakelite) results from the chemical combination of phenol and formaldehyde when a certain, definite order of steps is carried out in the making. The resultant product is synthetic resin which does not possess any of the properties or characteristics of its constituents.

The binder disclosed by Crupi is essentially a mixture of glue and rosin. The simple mixture of these two would not result in a binder which would resist the action of water and which would be flexible, since the glue would be softened by immersion in water and the rosin would crack when flexed. In order to modify these basic ingredients of the binder phenol is added to render the glue water-proof, but the binder is not tough or flexible because the rosin is not acted upon. As is stated by Crupi, page 2, lines 82 et seq., and page 2, lines 121 et seq.:

> "As the colloidal system exists now in this mixture of rosin, glue, phenol, acetic acid, and water, the union or intermixture of both phases, water-soluble and water-insoluble, is quite homogeneous and could be used with satisfaction ---"
>
> The resulting solution, when dry, is very water-proof, but not tough or flexible."

In order to render the binder flexible benzine is added to the mixture, and the formaldehyde treatment simply is used "to improve the qualities of the finished product" (p. 3, lines 40-45).

60 It is specifically stated by Crupi that the mixture, without the addition of formaldehyde, is quite satisfactory, but "a formaldehyde treatment, and finally a very thin coat of linseed oil will improve the qualities of the finished product considerably". It is, thus, seen that formaldehyde is in no sense an essential ingredient of the mixture, yet it is essential to the making of phenolic condensation product such as is claimed by the applicant.

Claims 1, 2, 3, 4, 5, 6, 8, 13, 14 and 15 all recite a sheet of material *impregnated* with a synthetic, flexible resinous varnish. The new result which is obtained by impregnation as distinguished from mere coating is discussed in the specification, page 3, lines 15 to 22 inclusive, wherein it is stated "The abrasive sheet just described is particularly characterized by the fact that its usefulness is in no way diminished by contact with water or oil,—even when the water or oil is permitted to come into contact with cut or torn edges of the sheet,—this being true because the flexible varnish, prior to baking, is permitted to penetrate the sheet to saturate all of its fibres and to occupy all of the interstices between the fibres."

The patent to Crupi is cited against all of the above claims yet, it is submitted, this patent fails to disclose a sheet of material which is impregnated with water-proofing compound. On the contrary the Crupi patent states
on page 3, lines 57 et seq. "the back of the paper is
61 primarily *coated* with any cheap water-proofing
compound—This is done as follows: The paper is
passed through a *coating* machine".

And again on page 3, lines 75 et seq: "After the back of the paper is so treated, it is passed through a coating machine where it receives the usual coating of glue. Immediately following, is sprinkled into the layer of glue which is yet warm and plastic, the usual coating of abrasive material. The paper then travels along racks into a sizing machine. Here, instead of being sized with ordinary glue solution, it is sized with said water-proofing solution which is immediately sprayed with a diluted formaldehyde solution."

The patent Baekeland additionally cited against claims 2, 3, 4, 6 and 8 also fails to disclose the impregnation of a backing material for the abrasive. In this case the abrasive is mixed with the phenolic condensation product and in this mixed form is "applied, coated or painted on wood, paper, metals, or any other materials which it may be found advantageous to use as supports" (page 2, lines 71-74).

Claim 1 is additionally rejected on the references cited in the last Office action. There are the patents Okie, Edwards, Baekeland, Matheson and the British patent No. 208,389. These patents, as has been pointed out in a previous amendment, all fail to disclose the invention recited in claim 1, namely the impregnation of a sheet with a flexible synthetic resinous varnish and the distribution over said sheet of abrading material.

62 Okie discloses a binder of gum varnish which acts as a moisture-proofing agent and which does not impregnate the sheet material used. As is stated in lines 76-80 of this patent the moisture-proofing agent penetrates into the material "to an extent short of exudation on an adjacent surface thereof".

Matheson does not disclose a synthetic resinous varnish but, on the contrary, relates to a nitro-cellulose coating, and moreover there is no hint of impregnation of the material to which the coating is applied.

Edwards relates to a machine for coating paper or cloth (page 1, lines 21, 22), and instead of using synthetic resinous varnish as is recited in applicant's claim, glue is employed as a binder. Similarly, the British patent fails to disclose either the binder composition or the impregnation of the backing material. This patent states that "the abrasive material is attached to a backing of paper or cloth with a sizing or *coating* of glue, gelatin or other similar adhesive material".

Claims 7, 9, 10 and 12 recite a binder of "phenolic condensation product" and also "Bakelite varnish". In addition they recite abrading material distributed over the sheet and retained thereon by the varnish.

Baekeland discloses a *mixture* of phenolic condensation product and abrasive, which mixture is applied, coated or painted on a backing substance. The particles of abradant are thus covered with the phenolic condensation product and are scattered throughout the mass of the mixture when

Div. 29 Room: 160 Annex.

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DEPARTMENT OF COMMERCE
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MAILED
MAY 23 1928

Paper No. 9.

All communications respecting this application should give the serial number, date of filing, and name of the applicant

May 23, 1928.

Please find below a communication from the EXAMINER in charge of this application.

Thomas E. Robertson
Commissioner of Patents.

G P O 11—

Applicant: W. Luxmore,

L. S. Wolfe,
Washington Loan & Trust Bldg.
Washington, D. C.

Ser. No. 50,477,
Filed Aug. 15, 1925,
For Water-Proof and Oil-Proof Flexible Abrader.

Responsive to amendment filed May 31, 1927.

Additional references made of record:-

✓ Graft,	1,217,595,	Feb. 27, 1917,	(51-195)
King,	1,235,325,	July 31, 1917,	" 279
/Lowry,	1,134,086,	Mar. 30, 1915,	91-68

Claim 1, which sets forth a sheet impregnated with a flexible synthetic resinous varnish, and having abrading material distributed over the sheet and retained thereon by the same material, is rejected on the patent to Crupi, of record, or Graft, in view of Baekeland, of record. All applicant has done is to substitute the synthetic flexible resinous varnish disclosed by Baekeland for the material used by Graft. The claim is also rejected on the British patent #208,389 of 1922.

Claims 2, 3, 4, 5, 6, 7, 10, and 12 do not patentably differ, and they are rejected on the patents above cited.

Claims 8, 9, 10, and 11 do not patentably differ, and are rejected on the patents above cited.

Claims 13 to 16 inclusive are rejected on the patents to Crupi, British patent #208,389, and Lowry.

Claim 18 is rejected on the patents to King and Baekeland.

Examiner.

APPLICATION DIV
NOV 22 1928
U.S. PATENT OFFICE

U.S. PATENT OFFICE
NOV 28 1928
DIVISION 58

IN THE UNITED STATES PATENT OFFICE

In re application of)
WILLIAM LUXMORE)
) Before the Examiner
WATER-PROOF AND OIL-PROOF)
FLEXIBLE ABRADER) Div. 29 Room 160 Annex
Serial No. 50,477)
Filed August 15, 1925)

HON. COMMISSIONER OF PATENTS
Washington, D. C.

Sir:

In response to the Official action of May 23, 1928, please amend the above identified case as follows:

Cancel claims 1, 2, 3, 4, 5, 7, 10, 11, 12 and 14.

~~Add the following claim:~~

~~19. The method of making an~~ abrading sheet impervious to water and oil, which consists in applying a coat of relatively thin flexible phenolic resin varnish to a face of the sheet, applying a granular abrasive agen to such coat to be retained thereby, and then baking the sheet which has been thus prepared.

D'

Add E'

E'

it has hardened. This patent, therefore, fails to
63 anticipate the claims.

The Crupi patent does not disclose a Bakelite varnish composition such as is claimed, and furthermore the particles of abrasive material are covered by the water-proofing solution as in the Baekeland patent instead of being distributed over the surface of the sheet as is claimed. In this connection the Examiner's attention is called to page 3, lines 75 to 86, of the Crupi patent which has been quoted above. In this paragraph it is specifically stated that after the abrasive material is sprinkled into the layer of glue the paper passes to a sizing machine and is sized with the water-proofing solution which is then sprayed with a diluted formaldehyde solution. The abrasive is thus covered with the water-proofing solution. It is not sprinkled upon the sheet of backing material as the final step, except for baking, in the manufacture of the article as in applicant's invention (see applicant's specification, page 3, the first two paragraphs).

Reconsideration of the rejection of claims 11, 16 and 18 is requested. The references all fail to show a binder of flexible synthetic resin in which abrading material is embedded, so that the abrading surface is free of binder. The patent to Hatch cited in the last Office action does not disclose the invention claimed. The use of hot wax or paraffin as a binder is not equivalent to the use of flexible synthetic resinous varnish and, it is submitted, this patent
64 fails to anticipate claims against which it is cited either in terms or in spirit.

In view of the foregoing it is requested that the claims remaining in this application be allowed.

Respectfully submitted,
WILLIAM LUXMORE,
By WILLIAMS, BRADBURY, McCALEB
& HINKLE,
Attorneys.

(Here follows 2 photos, side folios 65-66.)

67

Remarks.

Applicant has carefully reviewed all the claims in the application and has canceled nearly two-thirds thereof. He believes that the relatively few remaining claims are the minimum necessary to adequately protect his invention.

Claim 6 is the only retained claim of the first group stated by the Examiner to be not patentably different, and it is respectfully submitted that this claim is not met by any of the references cited in the last Office action, or earlier actions in this case.

Claims 8 and 9 are the only two retained of the second group, and these two claims differ patentably in that claim 8 states that the sheet is "impregnated", whereas claim 9 merely requires a "coating". It is very likely that in case of litigation the court might hold one of these patentable even if the other were held non-patentable.

Although the Examiner rejected claims 13 to 16 inclusive, he has indicated at a recent interview that claim 15 would probably be allowed. Applicant has canceled claim 14, but retains claims 13 and 16. None of the references cited against this group of claims relates to a condensation product used with an abrasive, and applicant is at a loss to understand the pertinency of the references cited.

Claim 18 is retained for the reason that neither King nor Baekeland discloses the essential feature of an abrasive which is free of binder on its abrading surface, 68 inasmuch as in both patents the abrasive is *mixed with* the binder instead of being embedded therein on one side only.

A new claim, number 19, has been added along the lines of claim 15, but somewhat broader, in that it omits the preliminary step of impregnating the sheet. As claim 15 now reads, it is possible that it might be evaded by an infringer by simply using a material for the sheets which is initially impervious to water and oil. The phenolic resin varnishes, as is well known, have the property of becoming impervious and insoluble upon heating or baking, and this new claim thus is descriptive of a complete, patentable process.

Reconsideration and allowance are requested.

Respectfully submitted,

WILLIAM LUXMORE,
By L. S. WOLFE,
Associate Attorney.

Washington, D. C., November 22, 1928.

Div. 58 Room 270 Annex

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DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Paper No. 11

All communications respecting this application should give the serial number, date of filing, and name of the applicant

Please find below a communication from the EXAMINER in charge of this application.

Thomas E. Robertson
Commissioner of Patents.

GPO 11—8623

MAILED
APR 30 1929

April 30, 1929

Applicant: William Luxmore

Ser. No. 50,477
Filed Aug. 15, 1925
For Water-Proof and Oil-Proof Flexible Abrader

L. S. Wolfe,
Washington Loan & Trust Bldg.,
Washington, D. C.

Responsive to amendment filed Nov. 22, 1928.

The following claims, found allowable, are suggested for purpose of interference. Applicant should make same by May 25, 1929, under the provisions of Rule 96, failure to do so will be considered a disclaimer of the subject matter involved:

The new article of manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state.

The new article of manufacture in the nature of sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond interposed between the grit and said backing for uniting a grit thereto and including an oil modified synthetic resinous condensation product which is solidified to combine with said backing to form a flexible and waterproof article.

The new article of manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state by the application of heat thereto.

The process of forming a flexible waterproof abrasive article which comprises condensing an aldehyde and a phenol in the presence of a catalyst at low temperatures to produce an adhesive product, applying such products together with an abrasive grit to a suitable backing, and heating said product whereby to form an abrasive device, which is flexible when solidified and insoluble in the presence of moisture and friction.

The process of forming a waterproof flexible abrasive article, which comprises applying to a suitable backing an adhesive coating including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst, embedding an abrasive grit, or layer in said adhesive coating, and setting such adhesive whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

E. F. Dowell
Examiner.

MAIL DIVISION
MAY - 9 29
U.S. PATENT OFFICE

12

UNITED STATES PATENT OFFICE

Applicant: William Luxmore
Invention: Water-Proof and Oil-Proof Flexible Abrader
Serial No.: 50,477 Filed August 15, 1925.

Case 13
Div. 58
Room 270-Annex

- - - - - - - - - -

1315 Monadnock Block,
Chicago, May 7, 1929.

U S PATENT OFFICE
MAY 10
DIVISION 58

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to Official Action, paper No. 11, applicant amends the above entitled application as follows:

Add the following claims:

~~20. The new article of manufacture,~~ flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state.

~~21. The new art~~icle of manufacture in the nature of sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond interposed between the grit and said backing for uniting a grit thereto and including an oil modified synthetic resinous condensation product which is solidified to combine with said backing to form a flexible and waterproof article.

over

Luxmore Amendment, Ser. No. 50,477 -2- May 7, 1929.

~~22. The new article of~~ manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state by the application of heat thereto.

(8)

~~23. The process of~~ forming a flexible waterproof abrasive article which comprises condensing an aldehyde and a phenol in the presence of a catalyst at low temperatures to produce an adhesive product, applying such products together with an abrasive grit to a suitable backing, and heating said product whereby to form an abrasive device, which is flexible when solidified and insoluble in the presence of moisture and friction.

~~24. The process of form~~ing a waterproof flexible abrasive article, which comprises applying to a suitable backing an adhesive coating including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst, embedding an abrasive grit, or layer in said adhesive coating, and setting such adhesive whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

REMARKS: 5'

The above claims are inserted responsive to Examiner's suggestion, for the purpose of interference.

Respectfully,
WILLIAM LUXMORE
By Williams Bradbury McCaleb & Hinkle
Attorneys.

Div. 58 Room 270 Annex

Paper No. 13

Address only "The Commissioner of Patents, Washington, D. C." and not any official by name

HCH:ERD

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant

GPO 11—[illegible]

Please find below a communication from the EXAMINER in charge of this application

Thomas E. Robertson
Commissioner of Patents

Counts compared

Applicant: William Luxmore

Ser. No. 50,477
Filed Aug. 15, 1925
For Water-Proof and Oil-Proof Flexible Abrader.

AUG 6 1929

L. S. Wolfe,
Washington Loan & Trust Bldg.
Washington, D. C.

The case, above referred to, is forwarded to the Examiner of Interferences because it is adjudged to interfere with others, hereafter specified. The question of priority will be determined in conformity with the Rules. The interference will be identified as No. 58728 On or before OCT 1 1929 the statement demanded by rule 110 must be sealed up and filed with the subject of invention, and name of party filing it, indorsed on the envelope. The subject-matter involved in the interference is

Count 1. The new article of manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state.

Count 2. The new article of manufacture in the nature of sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond interposed between the grit and said backing for uniting a grit thereto and including an oil modified synthetic resinous condensation product which is solidified to combine with said backing to form a flexible and waterproof article.

Count 3. The new article of manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state by the application of heat thereto.

Count 4. The process of forming a flexible waterproof abrasive article which comprises condensing an aldehyde and a phenol in the presence of a catalyst at low temperatures to produce an adhesive product, applying such products together with an abrasive grit to a suitable backing, and heating said product whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

Count 5. The process of forming a waterproof flexible abrasive article, which comprises applying to a suitable backing an adhesive coating including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst, embedding an abrasive grit, or layer in said adhesive coating, and setting such adhesive whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

The interference involves your application above identified and an application for Abrasive Article and Method of Making the Same, filed by Richard Paul Carlton, whose post office address is c/o Minnesota Mining & Manufacturing Company, Forest & Fauquier Streets, St. Paul, Minnesota, whose attorney is Paul Carpenter, 14 East Jackson Boulevard, Chicago, Illinois, and whose assignee is the Minnesota Mining & Manufacturing Company, St. Paul, Minnesota, and an application for Water Proof Polishing Paper, filed by Carl Klingspor, whose post office address is 13 Waldstrasse, Siegen, Province of Westphalia, State of Prussia, German Empire, whose attorneys are Haseltine, Lake & Company, 19 West 44th Street, New York, New York, and whose associate attorney is R. S. Waters, c/o Haseltine, Lake & Company, 19 West 44th Street, New York, New York.

The relation of the counts of the interference to the claims of the respective parties is as follows:

Counts	Klingspor	Carlton	Luxmore
1	36	59	20
2	37	62	21
3	38	63	22
4	39	73	23
5	40	74	24

After judgment of priority, this application will be held for revision in accordance with Rule 96.

H

E. F. Dowell
Examiner.

INTERFERENCE

Interference No. 58728 *Paper No.* 14

Name, William Luxmore

Serial No. 50,477

Title, Water-Proof and Oil-Proof Flexible Abrader

Filed, Aug. 15, 1925

Interference with Carl Klingspor

Richard Paul Carlton

DECISIONS ON MOTION

Law Examiner, *Dated,*

Board of Appeals, *Dated,*

DECISIONS ON PRIORITY

Ex'r of Interferences, adverse *Dated,* July 18/30

Board of Appeals, *Dated,*

Court, *Dated,*

REMARKS:

42

R

This should be placed in each application or patent involved in interference in addition to the interference letters by Primary Examiner.

11—[illegible]

6

#15

MAIL DIVISION
AUG 14 29
U.S. PATENT OFFICE

AUG 16 1929

UNITED STATES PATENT OFFICE

Applicant: William Luxmore
Invention: Water-Proof and Oil-Proof Flexible Abrader
Serial No.: 59,477 (0 written above the 9)
Filed August 15, 1925.

Case 13
Div. 58
Room 270-Annex

- - - - - - - - - - -

1315 Monadnock Block,
Chicago, August 10, 1929.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

The associate Power of Attorney heretofore given by the undersigned to Mr. L. S. Wolfe is hereby revoked, and request is made that all the communications in this application or any interferences in which it is or may be involved, be sent to the undersigned, the principal attorneys of record for the applicant, William Luxmore.

Respectfully,
WILLIAM LUXMORE
By
Attorneys.

58,728

14

IN THE UNITED STATES PATENT OFFICE
In re Application of
WILLIAM LUXMORE
For: WATERPROOF AND OIL-PROOF
FLEXIBLE ABRADER,
Filed: August 15, 1925,
Serial No. 50,477.

#16

DOCKET DIVISION
JUN 26 1930
U.S. PATENT OFFICE

POWER OF ATTORNEY

58728

Hon. Commissioner of Patents,
Washington, D.C.

Sir:

I hereby revoke all previous powers of attorney by me made in the above entitled application, and hereby appoint PAUL CARPENTER, Registry No. 5128, 14 East Jackson Boulevard, Chicago, Illinois, as my attorney, with full powers of substitution and revocation, to sign my name to the drawings, to prosecute this application and any renewals or divisions thereof, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Signed at Chicago, in the County of Cook, and State of Illinois, this 19th day of June. A.D.1930.

William Luxmore

APPROVED:
Albert G. McCaleb
(Albert G. McCaleb)

Accepted
JUN 30 1930
T. E. Robertson
Commissioner.

R

44

EEG #17

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

June 30, 1930.

Paul Carpenter,
14 East Jackson Boulevard,
Chicago, Ill.

Applicant William Luxmore
Serial No. 50,477
Filed Aug. 15, 1925
For Water-Proof and Oil-Proof Flexible Abrader

Div. 58.

In this case your power of attorney has been accepted.

Respectfully,

Thomas E. Robertson
Commissioner.

Revoking power of attorney

to

Williams, Bradbury, McCaleb & Hinkle,
1315 Monadnock Block
Chicago, Ill.

Div. 58 Room 270 Annex Paper No. 18

Address only "The Commissioner of Patents, Washington, D. C." and not any official by name

HCH:ERD

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

All communications respecting this application should give the serial number, date of filing, and name of the applicant

Please find below a communication from the EXAMINER in charge of this application.

Thomas E. Robertson
Commissioner of Patents.

MAILED
AUG 4 1930

August 4, 1930

GPO 11—8623

Applicant: William Luxmore

Ser. No. 50,477
Filed Aug. 15, 1925
For WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER

Paul Carpenter,
14 East Jackson Boulevard,
Chicago, Illinois.

Responsive to amendment filed May 9, 1929.

Claims 1 to 5, inclusive, 7, 10, 11, 12, 14 and 17 stand cancelled.

Claims 6, 8, 9, 13, 15 and 16 and claim 18 are again rejected on the references heretofore cited against them. They are also rejected as presenting no patentable novelty over count one of the interference in which this application was involved.

Claim 19 is rejected on the patents cited against claims 8 and 9.

Claims 20 to 24, inclusive, which were involved in interference with other pending applications and which was decided adversely to applicant, stand finally rejected. See Rule 132.

H

Laurence M Brown
Actg Examiner.

APPLICATION DIV. JAN 29 31

IN THE UNITED STATES PATENT OFFICE

Re application of :
WILLIAM LUXMORE :
S.N. 50,477
Filed Aug. 15, 1925 :
WATER-PROOF AND OIL-PROOF
FLEXIBLE ABRADER :

HONORABLE COMMISSIONER OF PATENTS,

Sir:

In response to the Office Action of August 4, 1930, please amend as follows:

Cancel claims 6, 8, 9, 13, 15, 16, 18, 19, 20, 21, 22, 23 and 24.

Add the following claims:

25. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

26. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing and heating the same to form the completed abrasive article.

27. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

28. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing and applying heat thereof at approximately 150°F. to form the completed abrasive article.

29. The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous condensation product in a volatile thinner to penetrate the backing and saturate the fibres, airdrying the sheet so treated to partially set the resinous impregnating coating, applying a binder coat of a synthetic resinous composition, partially setting the binder coat so applied anchoring a grit or layer of abrasive particles in the binder coat and then finally baking the article so made.

30. The method of making an abrasive article which includes as steps thereof, employing a backing, impregnating the backing with a synthetic resinous composition in a volatile thinner partially drying and setting the coating so applied to the backing, then applying a binder coat of a synthetic resinous material, applying a grit or layer of abrasive particles to the binder coat so applied before the binder coat has set to any appreciable extent and then ✓ backing the article so coated at approximately 150°F to completely form the abrasive article.

- REMARKS -

The claims previously made in this case have been cancelled without prejudice.

There are now submitted claims 25 to 30 which are directed specifically to the novel subjectmatter included by this application and which is not disclosed in either the prior art made of record by the Examiner or the applications of Carlton and Klingspore, the other interfering parties. The six claims directed to the method of making the abrasive article specifically include such phases of applicant's invention which is believed to be peculiarly valuable in making an abrasive article utilizing the synthetic resinous material as a sizing or binder coat. It will be noted that the resinous material used is heat deformable. In attempting to make an article in which the larger grits are to be anchored to the backing material employing the baking temperatures stressed in this application, the preliminary treatment stressed in these claims become important in assuring that the proper amount of binder coat is present to properly anchor the grit or layer of abrasive particles. By the method employed, a greater speed of operation is possible, assuring a proper bond between the grit or layer or abrasive particles and the backing material in that saturation is assured before the application of the heat without in any way robbing the abrasive particles of the requisite amount of binder previously applied.

Thus it will be observed that applicant is enabled to apply a thicker coat for the heavier grits of abrasive particles without any loss of this binder coat due to impregnation into the backing material.

In submitting these claims, careful consideration has been given to the art of record and while the resinous material contemplated by applicant is disclosed in Carlton, the senior party to the interference, the particular method herein applied for the novelty stressed is not disclosed.

49

Accordingly, it is believed that the amendment herein made should be entered and the claims allowed.

Respectfully Submitted,
WILLIAM LUXMORE

By. Paul Carpenter . . . .

New York-January 28, 1931.

Paper 29

Div. 58 Room 270 Annex

Address only
"The Commissioner of Patents,
Washington, D. C.,"
and not any official by name

CRC:ERD

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Paper No. 20

All communications respecting this application should give the serial number, date of filing, and name of the applicant

Please find below a communication from the EXAMINER in charge of this application.

Thomas E. Robertson
Commissioner of Patents.

MAILED
JUL 11 1931

July 11, 1931

GPO 11—[illegible]

Applicant: William Luxmore

Ser. No. 50,477
Filed Aug. 15, 1925
For WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER

Paul Carpenter,
14 East Jackson Boulevard,
Chicago, Illinois.

Responsive to amendment filed Jan. 29, 1931.

✓ Carlton, 1,775,631, Sept. 16, 1930, (51-280)

This patent was granted an application with which applicant was in interference.

Claims 25 to 30, inclusive, are rejected as being for an old process as disclosed by patents to Graft and Lowry. The use of any precise bonding material being nothing more than a matter of choice and the use of common sense, because it is obvious that any one wishing to manufacture a quality product will use the best materials obtainable which are commensurate with the price of the finished article. The use of one adhesive does not involve invention over the use of another. The above named references of record disclose the process and since no patentable invention has been set forth over the references of record in view of the interference issue, the present action is made final.

C.R.C.

E. F. Dowell
Examiner.

[illegible] - 51 [illegible]

U. S. PATENT OFFICE
JAN 22 1932
DIVISION 58

IN THE UNITED STATES PATENT OFFICE

ExP

In re application of

WILLIAM LUXMORE :
S.N. 50,477
Filed Aug. 15, 1925 :
for WATER-PROOF AND OIL-PROOF
FLEXIBLE ABRADER :
- - - - - - - - - - - - - - - - - - - :

NOTICE OF APPEAL TO THE
BOARD OF APPEALS

Honorable Commissioner of Patents,

Sir,

I do hereby appeal to the Board of Appeals from the decision of the Primary Examiner in the matter of my application for Letters Patent for WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER, filed August 15, 1925, all the claims of which, in the Office Action of July 11, 1931 were finally rejected.

The appeal fee of $15.00 is enclosed.

An oral hearing is requested.

The following are assigned as reasons for appeal.

First: That the Examiner erred in rejecting claims 25 to 30 as covering an old process as disclosed by the patents to Graft 1,217,593 and Lowry 1,134,086.

Second: That the Examiner erred in rejecting claims 25 to 30 as amounting to nothing more than a matter of choice and use of common sense in the use of the best materials obtainable.

Third: That the Examiner erred in rejecting claims 25 to 30 on the ground that the use of one adhesive does not involve invention over the use of another.

Fourth: That the Examiner erred in rejecting claims 25 to 30 on the ground that Graft and Lowry disclose the process, and since no patentable invention has been set forth over the references of record, in view of the interference issue.

4640

BOARD OF APPEALS
JAN 13 1932
U.S. PATENT OFFICE

50477

Fifth: That the Examiner erred in finally rejecting claims 25 to 30.

Sixth: That the Examiner erred in not allowing claims 25 to 30.

Seventh: That the Examiner erred in rejecting claims 25 to 30 notwithstanding each and every matter or thing of objection urged thereto by them thereagainst.

Respectfully submitted,

WILLIAM LUXMORE

By Paul Carpenter
PAUL CARPENTER, His Attorney

New York,

January 9, 1952

78 EFD:ERD Paper No. 22

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON, D. C.

February 1, 1932

MAILED
FEB 1 - 1932

In re application of
William Luxmore,
Serial No. 50,477,
Filed Aug. 15, 1925,
For: Water-Proof and Oil-Proof Flexible Abrader

Before the
BOARD OF APPEALS

****

EXAMINER'S STATEMENT

****

Applicant appeals from the action of the Examiner, finally rejecting claims 25 to 30, inclusive, which are all in Paper No. 19.

The references are patents to:

Graft,	1,217,593,	Feb. 27, 1917,
Carlton,	1,775,631,	Sept.16, 1930.

The invention is a method of making an abrasive article and the nature of the method will be apparent from the claims.

Patent to Carlton was granted on an application with which applicant was in interference.

The claims are considered to define nothing patentable over patent to Graft in view of patent to Carlton.

Graft discloses the practice of impregnating the flexible backing in the first operation with a waterproofing adhesive material and then applying as a second step a second coating of the same adhesive material as a binder for the grit. The expedient of applying the second coating before the first coating is entirely dry is not considered to be a patentable variation of Graft's method. It would seem to be obvious that an adhesive would more readily

50477 54 R

58,5[redacted]

Paper 21

adhere to a soft tacky surface of the first coating than it would to a hard smooth surface formed by thoroughly drying the first coating. Patent to Carlton discloses the use of a synthetic resin as an adhesive for attaching abrasive grains to a backing and no invention is seen in substituting Carlton's resinous adhesive for Graft's waterproofing and grit attaching adhesive. Carlton further discloses the practice of setting or curing the resinous adhesive by baking.

Patent to Lowry, 1,134,086, was also cited against the claims but this patent has been discarded as a reference.

Respectfully,

Examiner, Div. 58.

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON, D. C.

201-a Appeal No. 4640 Paper No. 28
Paper No.
Notice of Hearing

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

February 13, 1932.

Sir:

The case of William Luxmore

Serial
~~Interference~~ No. 50,477 will be heard by the Board of Appeals on the 5th day of May, 1932.

The hearings will commence at 9.30 A. M. and as soon as the argument in one case is concluded the succeeding case will be taken up.

If any party, or his attorney, shall not appear when the case is called, his right to an oral hearing will be regarded as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;
Inter partes appeals: Interlocutory and final hearings when no testimony has been taken, thirty minutes each side; final hearing when testimony has been taken, one hour each side.

By special leave, obtained before the argument is commenced, the time may be extended.

The appellent shall have the right to open and conclude in inter partes cases, and in such cases a full and fair opening must be made.

Briefs in inter partes appeals must be filed in accordance with the provisions of Rules 144 and 163.

Respectfully,

Thomas E. Robertson
Commissioner of Patents.

To

To
Mr. Paul Carpenter
14 East Jackson Boulevard
Chicago, Ill.

50477
56 R

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON, D. C.

201-a

[illegible] 4620
[illegible] Paper No. [illegible]

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

April 23, 1932.

Sir:

The case of William Luxmore

Serial
~~Interference~~ No. 50,477, will be heard by the Board of Appeals on the 25th day of May, 1932.

The hearings will commence at 9.30 A. M. and as soon as the argument in one case is concluded the succeeding case will be taken up.

If any party, or his attorney shall not appear when the case is called, his right to an oral hearing will be regarded as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;
Inter partes appeals: Interlocutory and final hearings when no testimony has been taken, thirty minutes each side; final hearing when testimony has been taken, one hour each side.

By special leave, obtained before the argument is commenced, the time may be extended.

The appellent shall have the right to open and conclude in inter partes cases, and in such cases a full and fair opening must be made.

Briefs in inter partes appeals must be filed in accordance with the provisions of Rules 144 and 163.

Respectfully,

Thomas E. Robertson

Commissioner of Patents.

To

To
Mr. Paul Carpenter
14 East Jackson Boulevard
Chicago, Ill.

[illegible]

90 [Stamp:] Board of Appeals, U. S. Patent Office, Apr. 22, 1932.

In the United States Patent Office.

Before the Board of Appeals.

In re Application of William Luxmore. S. N. 50,477. Filed Aug. 15, 1925. For Waterproof and Oilproof Flexible Abrader.

Honorable Commissioner of Patents.

Sir:

In the above entitled matter, counsel hereby requests that the hearing now set for May 5, 1932, be postponed for twenty days, to May 25, 1932, or to such time thereafter as counsel may be heard.

The request for this extension is made by reason of the fact that the trial of a case in the United States District Court for the Third Circuit of New Jersey set to begin on April 27, 1932, may run over until the day set for this hearing, and that further during this month, counsel has additional hearings before the Board and would like to avoid the time and expense of making more than one trip to Washington on these matters.

Respectfully,

WILLIAM LUXMORE,
By PAUL CARPENTER,
His Attorney.

New York, April 21, 1932.

91 [Stamp:] Board of Appeals, U. S. Patent Office, May 28, 1932.

In the United States Patent Office.

Before the Board of Appeals.

In re Application of WILLIAM LUXMORE. S. N. 50,477. Filed Aug. 15, 1925. Waterproof and Oilproof Flexible Abrader.

Brief on Appeal

To the Honorable Commissioner of Patents.

SIR:

This is an appeal from the final rejection of claims 25 to 30, as follows:

25. The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing to form the complete abrasive article.

26. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing and heating the same to form the completed abrasive article.

27. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

92 28. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing and applying heat thereof

at approximately 150°F. to form the completed abrasive article.

29. The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous condensation product in a volatile thinner to penetrate the backing and saturate the fibres, air-drying the sheet so treated to partially set the resinous impregnating coating, applying a binder coat of a synthetic resinous composition, partially setting the binder coat so applied, anchoring a grit or layer of abrasive particles in the binder coat and then finally baking the article so made.

30. The method of making an abrasive article which includes as steps thereof, employing a backing, impregnating the backing with a synthetic resinous composition in a volatile thinner, partially drying and setting the coating so applied to the backing, then applying a binder coat of a synthetic resinous material, applying a grit or layer of abrasive particles to the binder coat so applied before the binder coat has set to any appreciable extent and then baking the article so coated at approximately 150°F. to completely form the abrasive article.

93

The Invention.

The invention to which the above claims are directed relates to steps in the process of making an abrasive article, to wit, waterproof sandpaper.

This application has been involved in an interference with the patent to Carlton, 1775,631, owned by the assignee of this application. Originally, the issue of the interference involved the use of a synthetic resin in making a waterproof flexible sandpaper. The broad claims have been confined to the party Carlton, and now the attorney for Carlton, in charge of this application, has confined the claims of this applicant to a specific novel phase of the process, which is shown only in the present application.

The claims are directed to preliminarily coating the backing material with a synthetic resin and before completely setting this coating or while the coating has been permitted to partially set, the binder coat or grit holding coat is applied.

In the preferred form of the invention, the binder coat is of a similar material, that is to say, a similar synthetic resin as used in the pre-sizing coat. The process is completed by preferably baking at a temperature of about 150° F.

This application, therefore, has been confined to a comparatively simple issue.

The process involves the use of a synthetic resinous material as a pre-sizing coat for the backing, permitting the pre-sizing coat to partially set, preferably at room temperatures, and while in this condition applying a binder coat, preferably of the same synthetic resinous composition, and before the binder coat has completely set, applying a grit or layer of abrasive particles, and baking the product at approximately 150° F.

94 The Rejection.

The rejection has been reduced to a simple statement by the Examiner. Reliance is made upon the disclosure of the patent to Carlton, which admittedly uses the same material as contemplated by this present applicant. However, the method of forming the final article is not disclosed by Carlton and counsel for this present applicant, who has also prosecuted the application of Carlton to allowance, has confined the present claims to a distinctive phase of this applicant's process.

The Examiner further relies upon Graft, 1217,593 to show a manner of forming the article, which he alleges anticipates the patentable novelty of the claims.

Reference to Graft will now be made to show the manner he employs of building up a plural layered fabric which, but for the method contemplated by applicant, and the materials used by applicant, would have the same general appearance or the same number of laminations as that of applicant.

The material used by Graft is a solution of a cellulose ester, such as collodion. The backing material of paper, cloth or any other desired fabric, is first dipped in a solution of collodion. The coating is then permitted to become dry (see page 1, lines 55 and 56)—"To this end, after the first coating is dry, a second coat of the cellulose ester is applied".

Applicant, to the contrary, says that he first applies a coating of a synthetic resin, and permits the same to partially set, and then applies a binder coating, preferably at room temperature, and of the same character of material.

95 The question which is therefore raised is—Is a process which comprises overlying over a dried coat of a cellulosic ester, a second coat of a cellulose ester equivalent to that of applying to a partially set synthetic resinous coating, another coat of a binder, preferably also of similar material?

The Examiner takes the position that the expedient of applying the second coating before the first coating is entirely dry is not considered to be a patentable variation of Graft's method.

Here we have a contrary teaching in Graft to that of the process specifically claimed. A specific recitation is made in Graft that the preliminary coating should be dried before the binder coat is applied, and notwithstanding this specific prescription on the part of Graft, the Examiner claims that it would be obvious that an adhesive would more readily adhere to the soft, tacky surface of the first coating than it would to the hard surface formed by thoroughly drying the first coating.

It is worthy of examination to determine the manner in which the binder coat could be applied to the backing material.

1. It may be directly applied to the backing material.
2. The binder coat may be applied to a still moist pre-sizing coat.
3. The binder coat could be applied to a pre-sizing coat which is perfectly dry.
4. The binder coat could be applied to a partially set pre-sizing coat (the method herein specifically claimed to be novel).

96 The first method, applicant has found will, under operating conditions, particularly where a binder coat includes a solvent, result in an objectionable binder coat in that the normally porous backing material will rob or starve the binder coat and provide an insufficient binder for the abrasvie particles.

The second method will form a coat of indeterminate thickness so that when the grit or layer of abrasive particles is applied, the binder coat cannot be definitely controlled as to thickness and the grit may become too deeply imbedded. The coating operation over a still moist pre-sizing coat is one of extreme difficulty.

The application of a binder coat to a hard and perfectly dry pre-sizing coat (method No. 3), which is the process of Graft, and which may operate with Graft's particular materials, at least requires that the period of time after coating with the binder coat and before applying the grit or abrasive particles be sufficient to permit mutual solvent action. While this process may operate with a collodion solution, with synthetic resins, once a residuum has been formed, or drying is effected of a solution of a synthetic resin, in the methods prescribed for drying solutions of synthetic resins, considerable difficulty will be experienced in anchoring an overlying binder coat over a coating of a synthetic resinous material which has been dried by the methods prescribed therefor.

It therefore cannot be argued by analogy, in view of the difference of material, that the same process as used by Graft will be useful in connection with materials such as used by applicant, and also Carlton.

97 The Examiner's position on the obviousness of applying the binder coat to a still tacky or partially set pre-sizing coat, is certainly not supported by Graft, with totally dissimilar material, but on the the contrary, a distinctly different mode of operation is suggested by Graft. The obviousness of practicing the invention as taught by applicant is certainly not supported by any other art, wherein a plurality of coatings are applied.

It is common knowledge that in painting any surface with a plurality of coats, where painting a house, furniture, an automobile body or the like, that care is exercised to assure that the underlying coat is thoroughly dry and set before superimposing the next coating. In the automotive field, in finishing bodies, either by the lacquering process or the brushing process, sometimes involving from three to twenty-four coats, care is exercised to thoroughly dry each coat before the next succeeding coat is applied.

It is also common knowledge and well recognized, that in applying these numerous layers of materials, not only is each coat thoroughly dried before applying the next succeeding coat, but very frequently the setting of the coat is assured by spraying water on it to set it, drying the water therefrom, and then applying the next succeeding coat.

Applicant's method, therefore, is not obvious, as suggested by the Examiner, especially since the art and established practice direct entirely different modes of operation.

98 It is clear that with such established practice as referred to by applicant, where finishing coatings are applied to automobile bodies or other painted surfaces and where Graft also teaches this practice, that the method followed by applicant is not the obvious one, but that the tendency would be to follow the teachings of Graft and attain a deficient material in using the materials specifically prescribed by applicant.

The Examiner's observation of the obviousness of applicant's process is certainly not supported by the art, nor what may be considered as common knowledge in dealing with such surfaces as paint or collodion surfaces shown in Graft.

The advantages arising in using applicant's invention are more than the use of the knowledge that an adhesive would more readily adhere to a soft tacky surface than to a hard smooth surface. The invention goes beyond this point. With the character of material as used by applicant, completely setting and drying the first coat would tend to warp the composite under the baking temperatures employed. The first presizing coat, when applied, using a synthetic resinous material, would not readily respond to interaction with the overlying coat. Overlying a coating of a synthetic resin over a thoroughly dry and hardened presizing coat of synthetic resinous material would require additional time to effect the anchoring of the superimposed coating.

Superimposing a solution of a binder over a thoroughly dried and baked underlying presizing coating would deprive or starve the binder coat, and therefore improperly anchor the grit or layer of abrasive particles.

99 As has been stated by the applicant, by the procedure as outlined, applicant is enabled to apply a thicker coat of a binder, particularly valuable for the heavier grits of abrasive particles, without any loss of this binder coat due to impregnation in to the backing material.

The succession of steps as practiced by applicant, particularly with a synthetic resinous material, is peculiarly valuable with these materials and finds no suggestion in the prior art, particularly Graft or Carlton, to be practiced in this preferred manner.

It is therefore submitted that the Examiner's viewpoint as to the obviousness of applicant's process is not predicated upon any disclosure in the prior art, wherein a contrary procedure is emphasized, but is based upon a conclusion drawn after seeing applicant's claims. The position taken by the Examiner is based upon hind sight and not upon anything shown to be old and well known, and the established method of practicing a similar process.

In the absence of any disclosure of a similar procedure, any doubt as to the value of the process specifically claimed by applicant should be resolved in his favor.

It is therefore submitted that the final rejection of claims 25-30 was in error and that the claims should be allowed. Reversal of the Examiner's rejection, and allowance of the claims are therefore earnestly prayed for.

Respectfully submitted,

WILLIAM LUXMORE,
By PAUL CARPENTER,
His Attorney.

New York, May 21, 1932.

100 [Stamp:] U. S. Patent Office, Board of Appeals. Mailed Jul. 1, 1932.

In the United States Patent Office.

Before the Board of Appeals.

Decision.

Appeal No. 4640.

ST.

Ex parte WILLIAM LUXMORE

Application for Patent Filed August 15, 1925. Serial No. 50,477. Water-proof and Oil-Proof Flexible Abrader.

Mr. Paul Carpenter for applicant.

This is an appeal from the final rejection of claims 25 to 30, inclusive.

Claim 25 may be taken as an example:

25. The method of making an abrasive article which includes as steps thereof employing a backing, applying a

synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

The references relied upon are:

Graft, 1,217,593, Feb. 27, 1917;
Carlton, 1,775,631, Sept. 16, 1930.

The alleged invention relates to a process for mak-
101 ing a flexible abrasive article, as waterproof sand-
paper. It consists in applying to a suitable backing
a coating of a synthetic resin, permitting it to partially set,
then applying a binder coat of similar material and a layer
of grit.

The record shows that appellant was involved in Interference No. 58,727 with the application of Carlton. The latter prevailed and the Carlton patent, *supra,* issued with claims 1, 2, 3, 6 and 7 corresponding to the five counts of the interference.

Carlton uses the synthetic resinous presizing material called for in the claims and may apply one or more coats to the "backing". (page 4, line 28). He does not state that the auxiliary coat is applied before the first coat is dry. Graft applies a second coat of the cement after the first coat is dry (page 1, line 56). While these references do not disclose the application of the second coat after the first coat has only "partially set", the Examiner took the position that this was an obvious and not a patentable variation. We agree with this holding of the Examiner notwithstanding the advantages alleged by appellant to result from applying the second coat before the first is dry.

The decision of the Examiner is affirmed.

M. J. MOORE,
Assistant Commissioner,
W. S. RUCKMAN,
Examiner-in-Chief,
R. EDINBURG,
Examiner-in-Chief,
Board of Appeals.

July 1, 1932.

#28

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WASHINGTON, D. C.

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Ex parte William Luxmore, :
Serial No. 50,477, :
Filed August 15, 1925, :
Water-Proof and Oil-Proof :
Flexible Abrader. :

NOTICE OF SUIT UNDER SECTION 4915 R. S.

A suit in Equity under Section 4915 R. S., entitled MINNESOTA MINING AND MANUFACTURING COMPANY, Plaintiff, vs. THOMAS E. ROBERTSON, Commissioner of Patents, Defendant, Equity No. 55,194, involving this application, was filed on December 30, 1932, in the Supreme Court of the District of Columbia.

T. A. Hostetler,
Solicitor.

December 30, 1932.

MAIL DIVISION
APR 27 33
U.S. PATENT OFFICE

U. S. PATENT OFFICE
APR 28 1933
DIVISION 14

IN THE UNITED STATES PATENT OFFICE

In re Application of

Applicant: William Luxmore
For: WATER-PROOF AND OIL-PROOF FLEXIBLE ABRADER
Filed: August 15,1925
Serial No.: 50,477

Hon. Commissioner of Patents.
Washington, D. C.

Sir:

Please address all future communications in the above entitled matter to:

Paul Carpenter,
160 North LaSalle Street,
Chicago, Illinois.

and thereby oblige,

Respectfully,

Paul Carpenter
Paul Carpenter,
Attorney of Record.

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SPECIAL
CASE PENDING OVER
3 YEARS

CONTENTS.

1. Application __________ papers.
2. Rej FEB 11 1926
3. Assoc Power of Att JUNE 25,1926
4. Amdt A JUNE 25,1926
5. Rej NOV 23,1926
6. Amdt B JAN 19,1927
7. Rej MAY 5,1927
8. Amdt C MAY 31,1927
9. Rej MAY 23,1928
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12. Amdt E MAY 9,1929
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21. Appeal to Board JAN 11,1932.
22. Exam Statement FEB 1,1932.
23. Hearing MAY 5,1932.
24. Request to Postpone APRIL 22,1932
25. Hearing Postponed a MAY 25,1932
26. BRIEF..............May 23,1932.
27. DECISION BY BOARD....JULY 1,1932.
28. NOTICE OF SUIT.......Sect 4915
29. CHANGE OF ADDRESS......APRIL 27,1933
30. Not up for action
31. Sent to Hold abandoned
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Patented Nov. 24, 1931 **1,833,715**

UNITED STATES PATENT OFFICE

CARL KLINGSPOR, OF SIEGEN, GERMANY

WATER PROOF POLISHING PAPER

No Drawing. Application filed August 31, 1927, Serial No. 216,773, and in Germany September 10, 1925.

This invention has reference to water proof polishing paper and the like for the polishing and smoothening of coats of paint and the like by means of which the finishing operation in the application of coats of paints is greatly facilitated and accelerated, and the quality of the product is greatly improved. For the purpose of polishing or grinding for instance coats of varnishes, paints, filling coats and the like it is common to employ pumice stone with an addition of water. In order to facilitate and accelerate the polishing operation, polishing or burnishing paper or the like may be employed, and in order to be able to employ this kind of carriers provided with grinding and polishing material applied thereto by an adhesive, in the presence of water, such carriers with the coats applied thereto should be manufactured in such a manner that a water-proof product is obtained, that is to say, that for instance in the case of the use of paper the disintegration thereof is prevented and the granular treating material, such as glass, emery, garnet, carborundum is not readily detached from the carrier, such as paper, cloth, wood and the like.

Now in accordance with this invention a water-proof polishing or grinding sheet, paper or the like in which the polishing or grinding agent is secured to the base by a binding agent, such as animal glue or the like, is obtained by hardening the glue by liquid condensation products of phenols or the like with formaldehyde or the like, that is to say, with those products which are formed in the first stages of the well-known condensing processes or by such condensation products of the class referred to which are mixable with solvents.

The animal glue having been dissolved or soaked in water, and before being applied to the base, is mixed with the condensation products at a temperature which should not exceed 75 (seventy-five) degrees centigrade, so as to avoid the liability of a premature hardening of the glue. This mixture is applied as a coating to the paper or an equivalent carrier, and the grinding or polishing material is strewn on the surface. If required, a subsequent gluing is effected, and then the product is gradually heated to a temperature not exceeding 150 (one-hundred-and-fifty) degrees centigrade, and preferably kept at 120–130 degrees centigrade.

The heating is so arranged as to extend over a relatively long period of time, say for instance 10 to 36 hours, and the temperature, starting with about sixty (60) degrees centigrade is gradually increased, so that it is raised to 100 to 130 degrees centigrade during the last 6 hours. By this heating process the glue is hardened as a result of the influence of the condensation product and becomes entirely water-proof.

The subsequent gluing or sizing before the hardening operation may also be effected without the use of glue and merely by means of the phenol-formaldehyde condensation product which, if desired, may be diluted with alcohol.

In applying the glue alcohol may be used as a diluent, and glycerine or linseed oil or any other diluent may be added to the mixture. If paper is used as a base, it is preferably previously impregnated with linseed oil and dried. After the glue has been applied to the carrier base, and the polishing or grinding agent has been strewn upon it, and after any possible subsequent gluing or sizing has been effected, the product is dried in the manner referred to.

Example. 100 liters of a solution or of a soaked mixture of 1 part of glue in 5 parts of water are heated with 5 liters of glycerine and 8 liters of linseed oil to about 75° C. The condensation product of phenol and formaldehyde is diluted with alcohol sufficiently to have about the same viscosity as the glue, and is heated to about 50 degrees centigrade. Thereupon about 15 liters of the condensed mixture are cautiously introduced with constant stirring into the glue, while care is taken to avoid a rise of temperature above 75° C. This glue is applied to the paper or a similar base, and the grinding or polishing agent is sprinkled upon it. For the subsequent gluing or sizing a mixture of condensation product of somewhat different composition is preferably employed, thus for instance 100 liters of liquid condensation product, 150 liters of alcohol and 15 liters of glycerine. The hardening is then effected by drying in the manner indicated.

Instead of 8 liters of linseed oil for each 100 liters of glue-solution a smaller quantity may be used, and, if required, the use of linseed oil may be entirely dispensed with; but in such case it is advisable to increase the addition of glycerine, thus for instance up to about 10 liters.

The linseed oil and other fats and oils serve not only for the impregnation of the carrier base, but on the other hand also for reducing the amount of the condensation product, which latter, however, constitutes always the hardening agent proper. The presence of glycerine decreases the brittleness, and it also acts as a diluent for the glue, aside from or in addition to the diluting action of the alcohol.

It should of course be understood that the broad features of this invention are not restricted to the particular details herein described by way of exemplification and illustration only, but the principle of the invention admits of modifications and changes within the scope and spirit of the invention, as defined in the appended claims.

What I claim is:—

1. The method of manufacturing substantially waterproof abrasive sheets which comprises applying a mixture of glue, unsolidified phenol-aldehyde mixture and an alcoholic diluent to a carrier base at a moderately high temperature of about 75° C., applying an abrasive to the layer obtained on the carrier base, covering the resulting layer with liquid organic sizing material, and then gradually raising the temperature of the coated carrier base to a solidifying temperature of about 150° C. during a period of from about 10 to 36 hours.

2. The method of manufacturing substantially waterproof abrasive sheets which comprises applying a mixture of glue and unsolidified phenol-aldehyde mixture at a moderately high temperature substantially not above 75° C. to a carrier base, then applying an abrasive to the layer obtained on the carrier base, then applying to the resulting mixture a second layer of unsolidified phenol-aldehyde mixture and organic alcoholic diluent, and finally raising the temperature of the coated carrier base gradually to a maximum of about 120 to 130° C.

3. The method of manufacturing substantially waterproof abrasive sheets which comprises heating an aqueous solution of glue with an excess of glycerine and linseed oil to about 75° C., adding a moderately heated, unsolidified phenol-aldehyde mixture, applying the resulting mixture to a carrier base, applying an abrasive to the layer obtained on the carrier base, covering the abrasive with a mixture of liquid phenol-aldehyde condensation product, alcohol and glycerine, and then raising the temperature of the coated carrier base to a maximum of about 150° C. and baking the different layers.

In testimony whereof I have affixed my signature.

CARL KLINGSPOR.

DEFENDANT'S EXHIBIT No. 1.

Patented Sept. 16, 1930 **1,775,631**

UNITED STATES PATENT OFFICE

RICHARD PAUL CARLTON, OF ST. PAUL, MINNESOTA, ASSIGNOR TO MINNESOTA MINING & MANUFACTURING COMPANY, OF ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA

ABRASIVE ARTICLE AND METHOD OF MAKING THE SAME

No Drawing. Application filed March 13, 1926. Serial No. 94,597.

My present invention relates in general to the treatment of material, preferably in sheet form, and more particularly the treatment of material for the purpose of forming or attaining composite structures, of which well known forms of abrasives such as what is commonly known as sand-paper is an example.

Although I hereinafter disclose the practice of my invention in connection with abrasives such as sand-paper, it will be understood that my invention, or certain features thereof, have a wider field of utility.

Composite structures of the abrasive type such as sand-paper or emery cloth comprises generally, (*a*) a base of sheet material, which may be felted as in the case of paper or woven as in the case of cloth, (*b*) a more or less finely comminuted resistent material having abraiding properties, such as flint, garnet or corundum, and (*c*) a binder or adhesive which serves to bond the abrasive to the base.

The binders or adhesives heretofore employed have been generally of one of two general classes, (*a*) animal glue, of (*b*) vegetable oils and gums or the like.

These two classes of materials are open to certain objections when used for abrasive articles for certain purposes, viz, animal glue is hygroscopic and therefore cannot be successfully used in a water-abrading operation, nor has it thus far been successfully waterproofed as far as known to me, vegetable oils and gums require more or less elaborate treatment to render them satisfactory when used as bases for binders that are stable when used in a water-abrading operation, and both animal glue and vegetable oils and gums are more or less variable in quality and require careful checking and manipulation in order to produce continuous runs of material of an even quality.

The present invention contemplates the provision of a new abrasive article and a new method of making the same wherein there is employed certain resinous material, more particularly synthetic resins, of which certain phenol-aldehyde derivatives such as phenol-formaldehyde condensation products are examples, which viewed from certain aspects present features of novelty, and which can readily be controlled within certain predetermined and desired limits so that abrasive articles closely answering definite specifications can be more readily produced.

In its preferred form, the invention further contemplates the use of chemicals of known and quite definite characteristics whereby I am enabled to attain not only predetermined results as a result of the employment of my improved procedure, but am also enabled to attain certain results that have not been readily if at all obtainable for my purposes or for any purposes by prior procedure known to me.

Again, by synthetizing my improved binder I am enabled to avoid various objectionable features, such as loss of time, needless expense, and other factors due to variability in quality incident to variation in methods of preparation and the presence of impurities in unknown quantities in the cases of animal and vegetable products.

The principal objects of my present invention are the provision of an abrasive article having a binder which functions efficiently; the provision of an abrasive article having a binder characterized by the desired degree of flexibility; the provision of an abrasive article having a binder characterized by extensibility and compressibility to accommodate itself to flexion of the base without permanent distortion or deleterious disintegration; the provision of an abrasive article having a binder characterized by great tensile strength and resistance to shearing stresses; the provision of an abrasive article having a binder which is resistant to certain solvents, such as gasoline, met in certain abrading operations; the provision of an abrasive article having a binder of such a character that it can be manufactured rapidly; and moreover one which has characteristics permitting handling of the product expeditiously and especially one which allows such handling without impairment of the superficies of the material; the provision of an abrasive article having a binder which is advantageous in this that deterioration with age is minimized; the provision of an abrasive article having a binder rendering available certain water or oil abrading operations; the provision of an abrasive article having a binder embodying proportions of basic materials and of modifying agents of predetermined characteristics; the provision of an improved moisture proof abrasive structure; and the provision generally of an improved process for the production of an abrasive article characterized by one or more of the features which are among the objects of the present invention, together with such other objects and further and additional benefits and advantages as may hereinafter appear or be pointed out.

In the employment of my present invention for the production of sand-paper and the like (which I cite for purposes of example) I use as the base such a sheet of material (which may be paper) as will conveniently serve the employment contemplated, and as the abrasive such comminuted material (which may be flint, garnet or corundum, of the desired size) as is similarly adapted to perform the function in view.

It is most desirable that the binder utilized have the functions and characteristics not only of great mechanical strength including toughness, resistance to tensile and shearing strains, and of great binding strength including adhesiveness and tenacity, but also that it be non-hygroscopic, moisture resistent, easily worked, made of materials easily obtainable in the market, inexpensive, facilely worked and applied, of known quality when manufactured, and where used with a base which is penetrable, penetrative of such base so as to form a strong union therewith, and furthermore that it be as resistent as may be to the solvents ordinarily met with in abrading operations as commonly carried out.

I have discovered that resinous materials are preferable not only to gums (which are more or less water soluble) but also to gum-resins and to hardened oils for certain purposes contemplated by me, and particularly synthetic resins as peculiarly adapted for my ends for a number of reasons including that their characteristics can not only be better controlled than is the case with natural products, but that batches having the desired characteristics can be readily reduplicated. I have found that various aldehyde-phenol materials are available, but phenol-formaldehyde products of condensation is preferred by me as a major constituent of the binder, that is as best attaining the desired ends, viewed from certain aspects.

In preparing the binder for use, the resin is used directly in the early stages of reaction, or in connection with a suitable vehicle which I prefer is of such a type as a mixture of alcohol and benzol, for reasons which I will duly proceed to explain.

In applying a resin directly in the early stages of the reaction or prepared with a vehicle such as the stated mixture of alcohol and benzol to one surface of a base of paper, for example, there is involved a penetration of the base by the vehicle carrying along with it particles of the resin, to a point which approximates the opposite surface of the sheet, but preferably falls short of actual exudation of such vehicle and of resin particles to any excessive extent on such opposite surface.

This penetration by the vehicle, particularly when coupled with the use of the character of resin pointed out above results in a moisture proofing of the material against the destructive absorption of moisture through the surface opposite to that to which the binder is applied, and further results in a coating and binding action being secured between the fibres or threads of the base which substantially retards and for all practical purposes entirely prevents the deleterious disintegration of the base at least throughout substantially the effective abrading life of the abrasive article, in addition to preventing access of moisture through the base to the plane of contact between the base and the main mass of the binding material, thus preventing the formation of blisters and rupture of the bond between such main mass and the base which is deleterious even though the bond tenaciously cling to the abrasive particles.

The efficient action of the binder may be enhanced in the manufacture of sand-paper if applied to the base by the means of pressure.

Various degrees of flexibility can be imparted to the binder by the addition of various modifying agents, or combinations thereof or by breaking the binders at intervals after the fabrication of the article has been completed in certain cases.

The substances I have discovered to be particularly adapted to this purpose include glycerol, starch, dextrine, and sugar on the one hand, and various proteins, castor oil and shellac on the other hand.

Sand-paper made in accordance with the disclosure of my present invention is characterized by the desired degree of flexibility without adverse deleterious effects, great resistance to water and moisture generally, and to various other solvents employed in the arts, and a bond of great mechanical strength which is capable of sustaining the grit even in the case of the coarser grits where the strains are relatively high.

The amount of binder to be applied to the base varies according to several variable factors. Among these are (*a*) the thickness of the base, (*b*) the fineness or coarseness of the grit or layer of abrasive particles to be applied to the base, and (*c*) the contemplated use of the abrasive article. The amount of the binder applied can be regulated conveniently by the application of the binder to the base by means of squeeze rollers spaced for applying a coating or binder of predetermined thickness.

I have found in practice that the number of coats of the binder may also beneficially be varied according to (*a*) the thickness of the base, (*b*) the size of the grit, (*c*) the contemplated use of the abrasive article, and (*d*) whether the grit be incorporated in the binder before application of the binder to the base, or whether the grit be applied to the binder after such binder has been applied to the base.

I have also discovered that my improved binder may be suitably modified to permit its beneficial use as an auxiliary coating for waterproofing one or both sides of the base, and for applying an auxiliary coating to the grit carrying surface of the abrasive article.

I have further discovered that my improved binder when so suitably modified for use as an auxiliary waterproofing coating may be applied to the surface of the base which is opposite to the grit carrying surface either before or after the application of the bonding coat thereto, or contemporaneously therewith.

I have further discovered that by preheating the abrasive material before applying it to the bonding coat or commingling it therewith, a better bond than is otherwise to be had is attainable. I have found temperatures beneficial for such purposes to range about 150° F. to 175° F.

I have further discovered that the flexibility of the resultant article may be somewhat varied by heat treatment after the application of the binder and grit.

I have further discovered that by carrying out my improved process I am enabled to utilize resinous material without being under the necessity of employing oils in connection therewith, as have been heretofore employed in processes known to me.

While I have had the best results by following out the process hereinafter set forth, I have found it at times convenient and that tolerable results are attainable by the employment of certain synthetic resins obtainable on the market, when dissolved with suitable solvents and otherwise suitably modified, but the results thus had have not within my experience been comparable with those attained when the process is carried out ab initio in the making of the improved abrasive article without retracting any part of the process.

In carrying out my invention, in order that the resinous material may be a known quantity and of known quality I prefer to synthetize a phenol-aldehyde derivative, which may be a phenol-formaldehyde or phenol-furfurol condensation product, suitably modified and manipulated. I also contemplate the use of naphthol and an aldehyde and anthracene and an aldehyde. The treatment to which I subject these elements results in a composition in certain respects possessing novelty.

In producing the desired binder I have employed a number of alternative methods, each of which appears to have certain favorable characteristics and advantages.

One method which has given very good results will now be described in some detail as—

Method No. 1

In this method I employ a mixture of—

1 part commercial phenol (C_6H_5OH).

1 part 40% commercial formaldehyde (CH_2O).

$\frac{1}{10}$ part zinc chloride ($ZnCl_2$).

This mixture is placed in a flask fitted with a reflex condenser. It is heated with a low flame or by an oil bath. The heating is continued at a slow boil until the first appearance of a line of demarcation between the resinous matter (bottom layer) and the water (top layer). To catch this point in the early stages it is necessary to stop boiling to take observations. It is essential that the reaction should be stopped in the early stages to secure the desired fluidity. If the chemicals employed are substantially pure, the resinous matter at this stage is white in color and of the consistency of soft pitch. When it is proposed to use this resinous matter as a primary bonding coat for sand-paper the temperature is preferably maintained at about 100° F. to 150° F. in order to keep the viscosity as low as practicable and as is desirable in order that the material may flow freely. It will thus be seen that I produce by the foregoing method, a new composition of matter having certain characteristics rendering it particularly useful as a waterproof stable bond for sandpaper and the like, these desirable characteristics not being possessed by the composition prior to my treatment thereof nor in its final stage without my treatment. It may now be applied to the backing or base of the abrasive article, in the customary manner, a set of squeeze rolls spaced apart a predetermined degree being employed to determine the thickness of the coating of binder applied to the base. It should be borne in mind that the point at which the reaction is stopped affects the viscosity of the binder and hence the amount applied to the base at a given spacing of the rolls. It is also to be recognized that the relatively coarser grits require a greater thickness of bonding coating than the relatively finer grits and, therefore, that it is desirable to use a more viscous and consequently heavier coating for the coarser grits. In the case of the finer grits I find it expedient at times to employ a mixture Q. S. of alcohol (either CH_3OH or C_2H_5OH) and benzol (C_6H_6) or other solvents or mixtures such as acetone ($(CH_3)_2CO$) an amylacetate ($C_5H_{11}OCOCH_3$) for further reducing the viscosity of the resinous material.

If the grit has not been incorporated in the resinous material prior to the application thereof to the bases (as can be done especially in the case of the relatively finer grits) the grit is then applied to the base which has been coated with the resinous binder. In order to enhance the adhesion between the binder and the grit, the grit is preferably preheated to between 150° F. and 175° F. as hereinabove suggested.

In case the back of the base has not been theretofore waterproofed, or if the relative thickness of the paper renders it desirable to compensate for any starving of the bond between the binder and the base which might occur through the penetration of the binder into the base beyond a desired extent, or if the relatively larger size of the grit render such a step desirable in order to compensate for any deficiency in the bonding coat, an auxiliary coat or coats may now be applied, either to the back of the sheet opposite to the grit bearing surface or to such grit bearing surface, or to both.

The abrasive article thus produced is next cured by the application of heat which may conveniently be about 140° F. to 180° F. for a period of time, the duration of which depends on the degree of heat employed and the end point desired. I have used air heated to 165° F. for fifteen hours effectively. A certain degree of curing is necessary in order that the sheet of abrasive material may be insoluble to water. The final reaction may be further carried out by raising the temperature with consequent hardening of the article and increasing its resistance to solvents such as gasoline, alcohol, acetone, ethyl ether, etc.

A certain degree of flexibility is desirable. In the case of the relatively coarser grits, the degree of flexibility desired may be relatively little if any. In the case of the relatively finer grits a relatively high degree of flexibility may be desirable.

I have discovered in practice that the degree of flexibility may be varied somewhat by the heat treatment, that is the length and temperature thereof.

I have also found that especially in the case of the finer grits in order to gain in flexibility it may be desirable to add one or more of the modifying elements such as glycerol, etc., hereinabove mentioned, to the mixture first herein referred to under the caption "Method No. 1". The amount to be added is a matter depending upon certain variable factors, viz, the thickness of the bonding coat and the size of the grit, but the amount ranges too according to the particular modifying agent used. In the case of glycerol, for example, I have found that 20 parts by weight gives good results.

For the $ZnCl_2$ above referred to in connection with "Method No. 1", other catalytic agents may be substituted. Aluminum chloride ($AlCl_3$) and tartaric acid ($C_4H_6O_6$) are examples of these.

As an alternative to Method No. 1 (supra) I have also had good results with what I shall refer to as—

Method No. 2

In this method I employ a mixture of—

1 part phenol, (commercial).
1 part formaldehyde (commercial 40%).
1/20 part ammonia (NH_3 7%, H_2O 93%).

In this method I proceed as above outlined.

In both Method No. 1 and Method No. 2 the reaction is retarded in its early stages so that the resulting resin may be properly manipulated in the coating process. This is effected by discontinuing the heat, and, if necessary, washing the resinous material with water and partly neutralizing the catalyst employed, by suitable reagents which are well-known.

Where the washing is deemed to have removed a considerable portion of the formaldehyde, a small quantity of paraformaldehyde ($(CH_2O)_3$) may be added to the resinous mass before it is utilized. This addition of paraformaldehyde will evolve sufficient formaldehyde gas when subjected to final heating to carry the resinous mass to the end point desired.

Another alternative to Method No. 1 and Method No. 2 with which I have had comparable but less satisfactory results I shall refer to as

Method No. 3

In this method I employ a mixture of—

1 part of commercial synthetic resin, and of a well known and readily obtainable type known to the trade as bakelite resin "A"

1 to 3 parts dissolved in a solvent such as a combination of alcohol and benzol for the primary bonding coat, and

1 part of said commercial resin "A" and

2 to 4 parts of the solvent such as a mixture of alcohol and benzol for the auxiliary coats.

The alcohol and benzol mixture may be varied according to the conditions met in practice, but ordinarily I find that a mixture of equal parts of alcohol and benzol give quite satisfactory service.

I have discovered that in curing the product the best results are attained by controlling temperature between 140° F. and 180° F.

Having thus described my invention and illustrated its use what I claim as new and desire to secure by Letters Patent is:

1. The new article of manufacture, flexible

sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state.

2. The new article of manufacture in the nature of sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond interposed between the grit and said backing for uniting a grit thereto and including an oil modified synthetic resinous condensation product which is solidified to combine with said backing to form a flexible and waterproof article.

3. The new article of manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state by the application of heat thereto.

4. The new article of manufacture in the nature of sandpaper, which includes a backing, a grit or layer of abrasive particles, and a waterproof, stable adhesive bond for uniting the grit to the backing, said bond including a resinous condensation product of a phenol and aldehyde and a solvent therefor which serves as a vehicle therefor to penetrate the sheet and to solidify to a flexible and tenacious state rendering the article substantially insoluble in the presence of moisture and friction.

5. The new article of manufacture in the nature of sandpaper which includes a grit or layer of abrasive particles and a waterproof stable adhesive bond therefor including a resin which is flexible and insoluble in the presence of water and friction when solidified, the grit being in a heated state when joined with the adhesive bond to cause the latter to flow more intimately into contact with the particles of grit.

6. The process of forming a flexible waterproof abrasive article which comprises condensing an aldehyde and a phenol in the presence of a catalyst at low temperatures to produce an adhesive product, applying such products together with an abrasive grit to a suitable backing, and heating said product whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

7. The process of forming a waterproof flexible abrasive article, which comprises applying to a suitable backing an adhesive coating including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst, embedding an abrasive grit, or layer in said adhesive coating, and setting such adhesive whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

8. The process of forming a waterproof flexible abrasive article, which comprises applying to a suitable backing an adhesive coating including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst at temperatures between approximately 100° F. to 150° F. embedding an abrasive grit or layer in said adhesive coating, and setting such adhesive whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

9. The process of forming a waterproof flexible abrasive article, which comprises forming an adhesive material including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst, adding a solvent for such a product, applying the adhesive material to a backing to penetrate the same, separating the solvent therefrom, and embedding an abrasive grit or layer in said adhesive, and setting said adhesive whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

10. The process of forming a waterproof flexible abrasive article, which comprises applying to a suitable backing an adhesive coating including the initial reaction product of a phenol and an aldehyde in the presence of a catalyst, heating an abrasive grit and applying the same while hot to said coating to cause an intimate association of said coating and said grit, and setting such adhesive whereby to produce an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

In testimony whereof I have hereunto signed my name.

RICHARD PAUL CARLTON.

J. C. GRAFT.
ABRASIVE COATED MATERIAL.
APPLICATION FILED MAR. 27, 1912.

1,217,593. Patented Feb. 27, 1917.

Fig:1

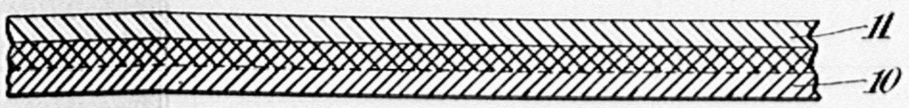


Fig:2

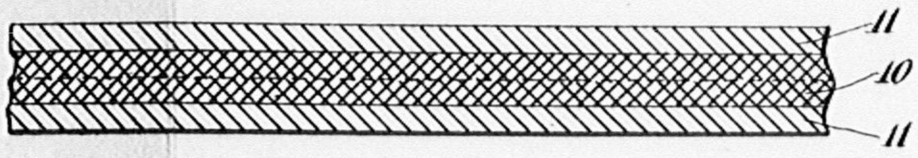


Fig:3

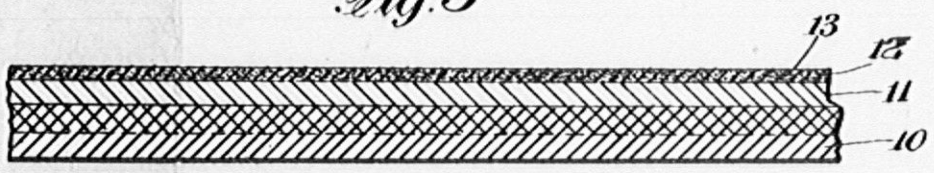


Fig:4

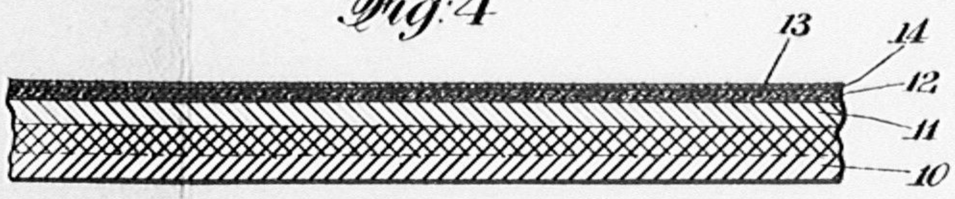
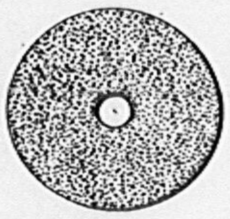


Fig:5



Witnesses:
John E. Rager
A. Worden Gibbs

Inventor
John C. Graft
By his Attorney Fred'k F. Schuetz

UNITED STATES PATENT OFFICE.

JOHN C. GRAFT, OF EAST ORANGE, NEW JERSEY.

ABRASIVE-COATED MATERIAL.

1,217,593. Specification of Letters Patent. **Patented Feb. 27, 1917.**

Application filed March 27, 1912. Serial No. 686,514.

To all whom it may concern:

Be it known that I, John C. Graft, citizen of the United States, and a resident of East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Abrasive-Coated Material, of which the following is a specification.

The invention relates to the manufacture of abrasive coated material and to a novel form of such material.

It has for its object to render the body of the material water-proof and to more securely hold the pulverulent attrition substance thereon. A further object of the invention is to give the abrasive coated material the necessary body and to render the same sufficiently resilient.

The nature of the invention will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 is an enlarged sectional view of the backing material coated on one side with the water-proofing compound.

Fig. 2 is a similar view illustrating a modification in which both sides of the backing material are thus coated.

Fig. 3 illustrates the second coating and the attrition substance applied.

Fig. 4 illustrates the final coating applied.

Fig. 5 is a face view of a dental attrition disk embodying my invention.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, 10 designates a suitable backing material of metal, wood, paper, cloth or any desired fabric and which, in accordance with my improved process, is rendered water-proof by coating one or both sides with, or dipping the backing material in a solution of a cellulose ester, such as cellulose nitrate (collodion). It is extremely desirable, particularly in the case of dental attrition disks as shown in Fig. 5, to employ material such as paper because of its pliability; but it has heretofore been extremely difficult to render the same water-proof. By applying the aforesaid coating, the material is rendered perfectly water-proof, remains sufficiently flexible for the purpose in view and at the same time provides a base into which the attrition substance may be forced. To this end, after the first coating 11 is dry, a second coating 12 of the cellulose ester is applied and the pulverulent attrition substance 13 such as emery, sand, quartz, corundum, carborundum, and the like, sprinkled on or otherwise applied while the said coating is still in moist and adhesive condition. The material may be brought through suitable rollers, preferably heated, to securely fix the pulverulent substance. After this, the final coating 14 is applied as a thin layer forming a finish and serving, moreover, to further retain any of the attrition substance which may not have been securely fixed to the backing material. In this connection, it is to be noted that the material employed as adhesive is the same as that employed for water-proofing the backing material and for giving body to the same, whereby a thorough incorporation of the attrition substance is effected. Different thicknesses of the various coatings may be employed to vary the thickness of the finished material, which may be cut into any desired shape, for example, in the form of a dental attrition disk as shown in Fig. 5. Its water-proof features are particularly valuable in this connection, as the attrition substance is not so readily loosened from its backing material when exposed to the moisture of the mouth. Dental attrition disks of the usual type are very quickly rendered useless due to this loosening of the attrition substance as well as to the destruction of their property of resiliency when becoming moist. The article herein set forth may be made extremely thin and yet have sufficient body, and its resiliency will be preserved; and furthermore, in view of the particular coating material employed, presents an agreeable, finished appearance.

I claim:—

1. A flexible dental attrition device comprising two moisture-proof layers intimately united to form a substantially homogeneous piece, the base layer being continuous and unbroken to impart strength to the device, and grit embedded solely in the second layer.

2. A dental attrition device comprising a moisture-proof flexible body layer having a grit-carrying coating of moisture-proof flexible material intimately combined therewith to form a substantially homogeneous piece, the grit being embedded solely in said coating, whereby the original strength of the body layer is not affected by the grit and the device is capable of continued use wet or dry until the grit is worn away.

3. A flexible dental attrition device comprising a moisture-proof base layer having one of its surfaces provided with grit united thereto by a cement which is a partial solvent of the surface of the material of the base layer.

Signed at Newark, in the county of Essex and State of New Jersey, this 25th day of March, A. D. 1912.

JOHN C. GRAFT.

Witnesses:
Robert B. Stoutenburgh,
Lydon E. Stoutenburgh.

116 [Stamp:] Mailed Feb. 1, 1932.

EFD:ERD.

Paper No. 22

Department of Commerce, United States Patent Office,
Washington, D. C.

February 1, 1932.

Before the Board of Appeals.

In re Application of WILLIAM LUXMORE. Serial No. 50,477. Filed Aug. 15, 1925. For Water-Proof and Oil-Proof Flexible Abrader.

Examiner's Statement.

Applicant appeals from the action of the Examiner, finally rejecting claims 25 to 30, inclusive, which are all in Paper No. 19.

The references are patents to:

Graft, 1,217,593, Feb. 27, 1917;
Carlton, 1,775,631, Sept. 16, 1930.

The invention is a method of making an abrasive article and the nature of the method will be apparent from the claims.

Patent to Carlton was granted on an application with which applicant was in interference.

The claims are considered to define nothing patentable over patent to Graft in view of patent to Carlton.

Graft discloses the practice of impregnating the flexible backing in the first operation with a waterproofing adhesive material and then applying as a second step a second coating of the same adhesive material as a binder for the grit. The expedient of applying the second coating before the first coating is entirely dry is not considered to be a patentable variation of Graft's method. It would seem to be ovious that an adhesive would more readily adhere to a soft tacky surface of the first coating than 116½ it would to a hard smooth surface formed by thoroughly drying the first coating. Patent to Carlton discloses the use of a synthetic resin as an adhesive for attaching abrasive grains to a backing and no invention is seen in substituting Carlton's resinous adhesive for Graft's waterproofing and grit attaching adhesive. Carlton further discloses the practice of setting or curing the resinous adhesive by baking.

Patent to Lowry, 1,134,086, was also cited against the claims but this patent has been discarded as a reference.

Respectfully,

E. F. DOWELL,
Examiner, Div. 58.

117 [Stamp:] U. S. Patent Office, Board of Appeals. Mailed Jul. 1, 1932.

Decision.

Appeal No. 4640.

In the United States Patent Office.

Before the Board of Appeals.

Ex parte William Luxmore.

Application for Patent Filed August 15, 1925. Serial No. 50,477. Water-proof and Oil-Proof Flexible Abrader.

Mr. Paul Carpenter for applicant.

This is an appeal from the final rejection of claims 25 to 30, inclusive.

Claim 25 may be taken as an example:

25. The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

The references relied upon are:
Graft, 1,217,593, Feb. 27, 1917;
Carlton, 1,775,631, Sept. 16, 1930.

118 The alleged invention relates to a process for making a flexible abrasive article, as waterproof sandpaper. It consists in applying to a suitable backing

a coating of a synthetic resin, permitting it to partially set, then applying a binder coat of similar material and a layer of grit.

The record shows that appellant was involved in Interference No. 58,727 with the application of Carlton. The latter prevailed and the Carlton patent, *supra,* issued with claims 1, 2, 3, 6 and 7 corresponding to the five counts of the interference.

Carlton uses the synthetic resinous presizing material called for in the claims and may apply one or more coats to the "backing". (page 4, line 28). He does not state that the auxiliary coat is applied before the first coat is dry. Graft applies a second coat of the cement after the first coat is dry (page 1, line 56). While these references do not disclose the application of the second coat after the first coat has only "partially set", the Examiner took the position that this was an obvious and not a patentable variation. We agree with this holding of the Examiner notwithstanding the advantages alleged by appellant to result from applying the second coat before the first is dry.

The decision of the Examiner is affirmed.

M. J. MOORE,
Assistant Commissioner,
W. S. RUCKMAN,
Examiner-in-Chief,
F. P. EDINBURG,
Examiner-in-Chief,
Board of Appeals.

July 1, 1932.

Endorsed on cover: District of Columbia Supreme Court. No. 6584. Minnesota Mining and Manufacturing Company, appellant, vs. Conway P. Coe, as Commissioner of Patents. United States Court of Appeals for the District of Columbia. Filed Oct. 25, 1935. Henry W. Hodges, Clerk.

FOR MR. CHIEF JUSTICE MARTIN

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA

FILED MAR 5 - 1936

FOR MR. CHIEF JUSTICE MARTIN

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA.

CLERK

OCTOBER TERM, 1935.
No. 6584.

MINNESOTA MINING AND MANUFACTURING COMPANY,
Appellant,

vs.

CONWAY P. COE, as Commissioner of Patents.

BRIEF FOR PLAINTIFF-APPELLANT.

H. H. BENJAMIN,
Solicitor for Plaintiff-Appellant.

PAUL CARPENTER,
J. T. BASSECHES,
Of Counsel.

RECEIVED BY

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J. [illegible]

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United States Court of Appeals,

FOR THE DISTRICT OF COLUMBIA.

OCTOBER TERM, 1935.

MINNESOTA MINING AND MANUFACTURING COMPANY,
Appellant,

vs.

CONWAY P. COE, as Commissioner of Patents.

No. 6584.

BRIEF FOR PLAINTIFF-APPELLANT.

MAY IT PLEASE THE COURT.

This is an appeal from the decision of the Supreme Court of the District of Columbia, dismissing appellant's Bill of Complaint.

The suit against the Defendant, the Commissioner of Patents, was brought in the Supreme Court of the District of Columbia under Section 4915 of the Revised Statutes of the United States as amended by the Act of Congress, Approved March 2, 1927, which was brought upon the refusal of the Commissioner of Patents to grant to appellant's assignor a patent for a method of making an abrasive article described as a Waterproof and Oilproof Flexible Abrader. The lower court, by its decision, entered a memorandum agreeing with the conclusions reached by the tribunals of the Patent Office (Record page 8).

Appellant availed himself of the remedy extended to him under Section 4915 R. S., in order to receive a patent for his invention, as specified in his claims, as follows:

Claim 25.

> The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing to form the complete abrasive article.

Claim 26.

> The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material and grit to said backing and heating the same to form the completed abrasive article.

Claim 27.

> The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing to form the completed abrasive article.

Claim 28.

> The method of making an abrasive article which includes as steps thereof employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the

same to partially set at room temperature, then applying a binder and a coating of similar material and grit to said backing and applying heat thereof (thereto) at approximately 150° F. to form the completed abrasive article.

Claim 29.

The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous condensation product in a volatile thinner to penetrate the backing and saturate the fibres, air drying the sheet so treated to partially set the resinous impregnating coating, applying a binder coat of a synthetic resinous composition partially setting the binder coat so applied, anchoring a grit or layer of abrasive particles in the binder coat and then finally baking the article so made.

Claim 30.

The method of making an abrasive article which includes as steps thereof, employing a backing, impregnating the backing with a synthetic resinous composition in a volatile thinner, partially drying and setting the coating so applied to the backing, then applying a binder coat of a synthetic resinous material, applying a grit or layer of abrasive particles to the binder coat so applied before the binder coat has set to any appreciable extent and then baking the article so coated at approximately 150° F. to completely form the abrasive article.

(Record pages 3 and 4).

While in the Patent Office appellant's application was involved in an interference with the parties R. P. Carlton and Carl Klingspor and the interference declared on August 6, 1929.

Carlton's application was filed March 13, 1926, and matured into Patent No. 1,775,631, a copy of which will be found in the Record, page 98.

220 US 428
In re Henry 55 App DC 396

Klingspor filed in this country August 31, 1927 and had Patent No. 1,833,715 issued to him on Nov. 24, 1931, a copy of which will be found in the record, page 96.

Appellant filed in this country August 15, 1925.

Judgment was rendered against Klingspor, the junior party, and thereafter a concession of priority was filed by Luxmore in favor of Carlton as to the counts of the interference as appearing in the Record, page 64.

After the termination of the interference, claims 25 to 30 (Record page 71) were presented as to subject matter disclosed in the Luxmore application and not disclosed in the applications of Carlton or Klingspor, the other interfering parties.

The claims so presented were finally rejected after the Carlton application matured into a patent on the ground that the process of the claims involved no patentable invention in view of the interference issue and the patents to Graft (record page 104) and Lowry. The Examiner, in his statement to the Board of Appeals, discarded the Lowry patent as a reference (Record page 79).

The Board of Appeals affirmed the final rejection (Record pages 108 and 109), holding:

> "Carlton uses the synthetic resinous presizing material called for in the claims and may apply one or more coats to the 'backing'. (page 4, line 28). He does not state that the auxiliary coat is applied before the first coat is dry. Graft applies a second coat of the cement after the first coat is dry (page 1, line 56). While these references do not disclose the application of the second coat after the first coat has only 'partially set', the Examiner took the position that this was an obvious and not a patentable

> variation. We agree with this holding of the Examiner notwithstanding the advantages alleged by appellant to result from applying the second coat before the first is dry".

Thereupon appellant availed himself of the remedy extended to him under Section 4915 R. S. by an action against the Commissioner of Patents in the Supreme Court of the District of Columbia, and the cause having been heard in open court and argued, upon pleadings and proofs adduced to the Court, the Court rendered the decision agreeing "with the conclusions reached by the Tribunals of the Patent Office" (Record page 8).

During the trial of this case before the Court hearing actions as provided by Section 4915 R. S., appellant presented expert testimony not before the Patent Office Tribunals, from which "patentable variation" could be determined and that that subject matter claimed by appellant and admittedly not disclosed in the prior art (Board's decision, Record pages 108 and 109) so that the Court might be able to determine the unobviousness of appellant's invention and for the determination of the patentable merit in the claims presented to the Court.

We respectfully submit that in the present appeal, this Honorable Court will see that the rejection of the appealed claims before the Patent Office Tribunals and the dismissal of the Bill of Complaint before the Supreme Court of the District of Columbia was clearly erroneous and the ends of justice clearly require a reversal; that no favorable presumption should be formed due to the different rejections by the various Tribunals of the Patent Office which rejected the claims; on the contrary, we assert with entire confidence that the appealed claims possess all the attributes of patentable invention and we think that from the record of appellant's case in the Patent Office and the testimony adduced before the Supreme Court of the District of Columbia, the Court's conclusion agreeing with the Tribunals of the Patent Office is wrong and should be reversed.

Assignments of Error.

The errors assigned to the decision of the Court in the Supreme Court of the District of Columbia are as follows:

1. In holding the claims involved in the suit unpatentable over the patents to Graft No. 1,217,593 and Carlton No. 1,775,631;
2. in adopting the decision and conclusions reached by the Board of Appeals;
3. in agreeing with the conclusions reached by the Tribunals of the Patent Office;
4. in holding Plaintiff as not entitled to a decree for the claims involved in this suit;
5. in dismissing the bill of complaint.

THE INVENTION.

It will thus appear that the invention claimed is directed to the production of an abrasive article which employs, in general, a backing material, such as paper, a binder (adhesive) to unite thereto abrasive particles to form a material which may be simply termed "sandpaper".

As the claims are directed to method steps, an enumeration of the steps involved in each of the claims may serve to clarify the issue.

The steps in each of the claims are as follows:

CLAIM 25

(a) applying a synthetic resinous presizing coating to said backing;

(b) permitting the same to partially set;

(c) applying a binder (of similar material, i.e., synthetic resinous material) and;

(d) a coating of similar material (i.e., synthetic resinous material);

(e) and grit to form the complete abrasive article.

CLAIM 26

(a) applying a synthetic resinous presizing coat to said backing;

(b) permitting the same to partially set;

(c) applying a binder (of similar material, i.e., synthetic resinous material) and;

(d) a coating of similar material (i.e., synthetic resinous material);

(e) a grit to said backing;

(f) heating to form the complete abrasive article.

CLAIM 27

(a) applying a synthetic resinous presizing coating to said backing;

(b) permitting the same to partially set at room temperature;

(c) applying a binder (of similar material, i.e., synthetic resinous material) and;

(d) a coating of similar material (i.e., synthetic resinous material);

(e) and grit to form the complete abrasive article.

CLAIM 28

(a) applying a synthetic resinous presizing coating to said backing;

(b) permitting the same to partially set at room temperature;

(c) applying a binder (of similar material, i.e., synthetic resinous material) and;

(d) coating of similar material (i.e., synthetic resinous material);

(e) a grit on said backing;

(f) applying heat at 150° F. to form the complete abrasive article.

CLAIM 29

(a) applying a synthetic resinous material in a volatile solvent to penetrate the backing and saturate the fibres;

(b) air drying the sheet to partially set the resinous impregnating coating;

(c) applying a binder coat of a synthetic resinous composition;

(d) partially setting the binder coat;

(e) anchoring abrasive particles in the binder coat; and

(f) finally baking the article.

CLAIM 30

(a) impregnating the backing with a synthetic resinous composition in a volatile thinner;

(b) partially drying and setting the coating;

(c) applying a binder coat of synthetic resinous material;

(d) applying a layer of abrasive particles before the binder coat has set to any appreciable extent;

(e) and baking the article at 150° F.

It is to be noted that in claims 25, 26, 27 and 28, "a binder and a coating of similar material" has reference to one or more binder coats, as referred to in the Record, page 31.

From an analysis of the claims for which Appellant has instituted suit to receive a patent for his invention and from the testimony adduced at the trial of the case before the Supreme Court of the District of Columbia, the features of the invention may be emphasized.

The invention is concerned with the provision of a flexible product which is impervious to and unaffected by water or oil (Record page 29). The "abrader" is quite flexible and capable of retaining its granular abrading material under flexure. The abrader employs, as its water and oil proofing agent, a material which is an extremely effective holder or binder for the abradant employed. The oil and waterproofing agent is a flexible varnish known under the trade mark "Flexible Bakelite Varnish", which is a phenolic condensation product.

The initial step in the process is the application of the flexible Bakelite varnish to a sheet or strip of suitable material, for example, paper (Record page 29). This first step has been referred to in the record (Record page 30) as an impregnation operation and is accomplished by immersing the sheet or applying the flexible Bakelite varnish with a brush while the Bakelite is quite thin and free-flowing, being thinned, if necessary, by the addition of benzol and/or alcohol, so that it will readily penetrate the sheet thoroughly, to saturate its fibres and to fill up the interstices (Record page 30). This initial procedure is designated in claims 25 to 28 as "applying a presizing coating to the backing"; in claim 29 as "applying the synthetic resinous material to penetrate the backing and saturate the fibres"; in claim 30, as "impregnating the backing with a synthetic resinous composition in a volatile solvent".

The next step involved is to permit partial setting of this material so applied and is the step (b) in each of the claims. The step (b) is an intermediate step and is specifically qualified and comprises the essential novelty in conjunction with the succeeding steps in that the sheet, with its already applied pre-sizing coating, is only permitted to partially set before addition to this presizing of the succeeding binder coat or the materal which actually anchors the abrasive particles to the backing.

To permit a clearer understanding of Appellant's invention the expert's observation may be noted as to the nature of the synthetic resinous material which is used in the presizing coating and in the binder coat or coats. The expert made the observation that this synthetic material is one of three general distinguishable types of coating materials, as follows:

> 1. Represented by linseed oil or linseed oil varnishes which dry to a film by the absorption of oxygen from the air. The liquid picks up oxygen from the air and dries to a firm, final film (Record page 14).
>
> 2. Represented by the nitro-cellulose lacquer. Such films dry solely by the evaporation of solvents. The solution is spread out on the surface and the solvent evaporates into the air and leaves this residuum as a film. Collodion is

> typical of this type of lacquer (Record page 14).
>
> 3. Represented by the synthetic resins, (which Appellant uses), for example, Bakelite. These materials have the property of becoming infusible and insoluble upon the application of heat alone, that is, they have a resting stage and can be subsequently heated. They contain, in themselves, all the necessary working ingredients to be transformed to a finally insoluble material.

Reference has been made to the three distinguishable types of coating materials in order that a comparison may be made of the dissimilar properties of materials used in the prior art and that material which is a specific and important part of the method employed, defined in the claims before this tribunal.

Both the procedural steps of the method and the ingredients employed, as to their physical and chemical characteristics, are urged as important considerations.

With this introduction, reference may now be made to the record adduced at the trial of the case before the Supreme Court of the District of Columbia so that this Tribunal may weigh the assumed expert view of the Patent Office and the actual expert views, as to the invention involved.

The Combined References Urged by the Patent Office Tribunals.

The testimony adduced at the trial of the case shows that the art relied upon by the Commissioner of Patents is the same as that relied upon in the record of the case in the Patent Office (Plaintiff's Exhibit No. 1), such art being the patents to Carlton, 1,775,631 and Graft, 1,217,594.

THE PATENT TO CARLTON NO. 1,775,631.

Briefly stated, as in any way relating to the issue involved in this suit, the Carlton patent shows that an abrasive article in the nature of sandpaper may be made by applying to a flexible backing material, a binder coat of a phenol formaldehyde condensation resin in which the abrasive particles are embedded. So far as building up a plural coated article is concerned, Carlton says, in the matter beginning line 17, page 4 of the patent (Record page 98)—

> "In case the back of the base has not been theretofore waterproofed, or if the relative thickness of the paper renders it desirable to compensate for any starving of the bond between the binder and the base which might occur through the penetration of the binder into the base beyond a desired extent, or if the relatively larger size of the grit render such a step desirable in order to compensate for any deficiency in the bonding coat, an auxiliary coat or coats may now be applied, either to the back of the sheet opposite to the grit-bearing surface or to such grit-bearing surface, or to both." (R. page 101).

Therefore, Carlton had the problem of overcoming the starving of the binder after the binder coat and the abrasive particles were already imposed upon the backing and—

> "he attempted to solve that difficulty, as he said, by applying what we might call a sand-sized coat." (R. page 18).

The second coat of Carlton was applied after the binder coat and the abrasive particles were already fixed in position.

The witness was asked—

> "Have you any reason to assume that in applying a plurality of coats he contemplates letting them dry completely or putting them on fresh one after another, or letting them dry partly?" (R. page 23).

The witness answered—

> "He does not say anything about that at all." (R. page 27).

The following is what the Board of Appeals, in the record of the Patent Office, Exhibit 1, found, and was referred to by the Solicitor for the Commissioner of Patents. The quoted portion from the decision by the Board of Appeals which relates to Carlton, is as follows:

> "He does *not* state that the auxiliary coat is applied before the first coat is dry." (Record page 109).

Carlton is therefore silent as to the specific teachings of the process claimed by Plaintiff in the Luxmore application, and the purpose of the plural coats after the binder coat and abrasive particles are in position, as considered by Carlton, is to overcome a deficiency by reason of the direct union of the binder coat for the abrasive particles to the backing material.

THE PATENT TO GRAFT NO. 1,217,593

(Record page 104)

Graft produces an abrasive coated material with a paper backing material, to which he applies a solution of collodion. After the first coating is dry, a second coating of cellulose ester, such as cellulose nitrate (collodion) is applied, and the emery, sand, quartz, corundum, is then sprinkled thereon, and the whole sheeting dried. (R. page 16).

The plaintiff introduced into evidence the patent to Klingspor, No. 1,833,715 (Plaintiff's Exhibit 2, R. page 96). This patent shows the production of an abrasive article in which the paper base is impregnated with linseed oil and dried and the binder coat for the abrasive is then imposed thereon.

The record therefore shows three types of coating materials (R. page 14), one type being the liquid oil or varnish which dries to a film by the absorption of oxygen from the air, exemplified in Klingspor; the second type is the nitro cellulose lacquer in which the films dry solely by evaporation of the solvent, and the third type, the synthetic resin type which contains in itself all the necessary working ingredients to be transformed to a final insoluble material (the material used by the contemporaneous inventors Carlton and Luxmore—R. page 14).

Luxmore, the Inventor, Has Derived no Benefit From the Teachings of Carlton or Graft.

Reverting to the decision by the Board of Appeals (R. page 109) second full paragraph) it is clear that the Patent Office does not consider that the art *anticipates* the specific procedure set forth in the Luxmore claims.

This is in accordance with the findings by Dr. Barsky, the expert in this case (R. page 18).

The record further shows that no attempt to vary from the specific teachings of Graft, with his evaporating type of paper and sizing material, and with the oxidizing type of sizing material shown by Klingspor, would be made as such procedure would be destructive of obtaining a desirable end product.

The expert has stated that if Graft's evaporating type of sizing coat were used, and the first coat were in a partially dry or set condition before the binder coat was put on, you would get a final sheet which was wrinkled and blistered (Record page 17).

So also, there is no suggestion in the oxidizing type of sizing material exemplified in Klingspor in which linseed oil was used. The expert points out that if the binder for the abrasive were placed on top of the oil film in a partially dry or partially set condition, the film on top would be soft and would tear away (Record page 16).

The record further shows that Plaintiff derived no contribution from the teaching of the old art of putting on plural coats in painting automobiles with the oxidizing type or evaporating type of paints, for in putting on a number of coats to automobile bodies or to furniture, each coat had to be thoroughly dried before the next coat was applied; otherwise you would get an "orange peel" effect or blistering, distortion and unevenness (Record page 17).

If intimate adhesion between the binder coat and the backing material were the objective, the expert tells us that the best bond between the binder coat and the paper would be obtained by putting the bonding coat right on the paper (Record page 17).

If Plaintiff's synthetic resinous material, in the manner described by Graft, were used, that is, putting on a pre-sizing coat and completely curing the same and then applying the bonding coat and abrasive and further curing, one would get reduced flexibility over Plaintiff's process and reduced bonding effect (Record page 18).

The expert was asked what the effect would be of not permitting the pre-sizing coat to dry enough (Record page 21). The expert clarified his position that this would have the same effect as putting one heavy bonding coat on top of the unsized paper, the witness stating—

> "If you did not allow the presizing effect to take place, you would have the same thing as putting the heavy bonding coat right on top of the unsized paper."

In view of the state of the art, and the experience of those skilled in the art, as demonstrated by the difficulties in any attempt to vary from the procedure disclosed by the art, Dr. Barsky, an expert, endowed with the knowledge of the art more than expected of a skilled worker, stated—

> "I think my tendency would be to completely cure the under coat. If I wanted to size the paper so that the next coat would not penetrate the paper, I would cure the under coat completely" (Record page 19).

The effect of this procedure is to obtain decreased flexibility. Dr. Barsky, the expert stated—

> "You would get decreased flexibility if you completely cured the presize and then put the bonding coat on a completely cured, finished sheet again. That is, it would be analogous to the procedure of Graft of curing the sizing coat and then putting the bonding coat on and then curing again." (Record pages 18 and 19.)

The facts of the record and the art relied upon by the Commissioner of Patents failing in any respect whatsoever to suggest Plaintiff's novel step in the process, the Patent Office tribunals have branded Plaintiff's procedure as obvious on the theory that—

> "It would seem to be obvious that an adhesive would more readily adhere to a soft tacky surface of the first coating than it would to ~~be~~ a hard smooth surface formed by thoroughly drying the first coating" (quoted from the Examiner's Statement in Exhibit No. 1 of Plaintiff, Record page 107 ~~91~~).

To this Dr. Barsky replied:

> "If I wanted to get the best bond between the binding coat and the paper, I would do as Carlton did: put the bonding coat right on the paper." (Record page 17).

Any obvious objective from the materials known in the art, exemplified by Graft and Klingspor, would be completely to set the pre-sizing coating, and this would be productive of decreased flexibility. The objective of more intimate adhesion between the binder coat and the backing would be in accordance with Carlton, which would require compensation for the starving effect. Both of these procedures as suggested by the art would be accompanied by a stiffening action, giving a sheet of diminished flexibility.

The new, unobvious procedure claimed by Plaintiff is the *partial setting* or partial drying of the pre-sizing coat before application of the binder coat, with the new, unobvious and unexpected results of obtaining increased flexibility, without the sacrifice of adhesion between the abrasive and the backing material. The record, the facts, and the expert's opinion all support this contention.

The Carlton Patent is not a Legitimate Reference for Prior Knowledge.

In the interference proceedings which involved appellant and the Carlton patent, appellant only conceded priority of the counts of the interference. The claims now on appeal before this Tribunal are to an entirely different invention, otherwise the Patent Office would have rejected the claims on appeal only upon the Carlton patent in that the claims here on appeal were directed to subject matter within the scope of the interfering issue.

However, the claims were rejected on the Carlton patent with the observation that while this patent did not show "the application of the second coat after the first only has only partially set", it would be obvious and non-patentable to modify this to arrive at the invention of the claims.

However, in arriving at this conclusion, reference was made to the patent to Graft, utilizing a totally dissimilar material, the properties of which are so distinguishable that nothing could be said to be borrowed from this disclosure.

The question at issue is whether the patent to Carlton is legitimately cited by the Patent Office Tribunals in their rejection of the claims, since the application upon which the patent to Carlton issued was filed subsequent to the filing of the application of Luxmore, appellant herein.

A patent might be cited as either

(1) a prior publication (including printed patents);

(2) a prior patent (prior monopoly);

(3) to show prior invention; or

(4) to show prior knowledge or use.

No assignment of Error on this point.

It is manifest that the Carlton patent is not cited as a prior publication since appellant's application (Luxmore), was filed prior to the issuance of the Carlton patent.

Section 4886 R. S. (U. S. C. title 35, Sec. 31) as to its essential portions reads as follows:

> "Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvements thereof, * * * not known or used by others in this country, before his invention or discovery thereof and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his application and not in public use or on sale in this country for more than two years prior to his application, * * * may, * * * obtain a patent therefor.

This section of the Revised Statutes is the basis for the citation of Carlton. It is urged as will more clearly appear hereafter, that neither in fact nor in law could Carlton be legitimately considered prior knowledge.

It is also clear that the Carlton patent was not cited as a patent monopoly since here again it was not granted until after the filing of appellant's application, the Luxmore application, upon which this suit is brought and for the further reason that the invention of the claims in suit was not claimed by Carlton who was in interference with Luxmore.

It is also clear that the Carlton patent was not cited to show prior invention, because the invention of the rejected claims is not disclosed in the Carlton patent (the rejection being on the ground of lack of invention, rather than novelty).

Even if it be assumed that the Carlton patent was cited for the purpose of showing prior invention, it would be insufficient and ineffective for that purpose because the date for a patent cited on the question of priority is the filing date thereof, as established in *Alexander Millburn Co.* vs. *Davis Bournonville Co.* 270 U. S. 390.

This is so since the Luxmore application was filed before the filing date of the patentee, Carlton.

The purpose for which the patent to Carlton was cited in the rejection of the claims in the Patent Office Tribunals and with which the Court below, in error, apparently agreed, was to show that the invention or something not patentably different therefrom was known or used before the invention or the discovery thereof by Luxmore, the appellant.

The restrictions of Section 4886 R. S. (*supra*) state that a patent should not be granted for an invention "known or used by others in this country before his invention or discovery thereof."

Carlton having filed his application in May, 1926 and appellant having filed his application in August, 1925, it is clear that whatever disclosure is made in the Carlton patent was *not* known *"before the invention or discovery thereof"* by appellant who precedes the earliest date of filing of Carlton by about eight months.

It has been established by the Supreme Court in *Millburn Co.* v. *Davis Bournonville Co., supra,* that the effective date of a patent is the filing date thereof for everything shown and disclosed therein.

The ruling of the *Millburn* case that the effective date of a reference is the filing date has been the ruling of the Patent Office Tribunals even prior to the Supreme Court decision. See *ex parte Ham-*

mond and Hammond, 1922, C. D. 15; *ex parte Jencick,* 1925, C. D. 41, and *ex parte Stone,* 1925, C. D. 97, 99, as follows:

> "Claim 4 was denied patentability by the Examiner upon the Thornycroft reference; but the Examiners in Chief sustained applicant's contention that he was entitled, as to this claim, to the filing date of his application No. 192,130, filed September 19, 1917, now Patent No. 1,311,780, for constructive reduction to practice, and since such date was earlier than Thornycroft's filing date the latter's patent was not a reference."

The last cited decision of the Assistant Commissioner of Patents is direct authority to the effect that so far as the Patent Office Tribunals are concerned that a patent granted on an application filed *subsequent* to the filing date of a rejected application is *not* an effective reference.

Certain decisions following the Supreme Court decision in the *Millburn* case interpret that decision so as not to consider a patent granted on an application filed prior to the filing date of the patent in suit, as part of the prior art, to limit the Supreme Court decision to direct anticipation. See, for example, *Stelos Co.* v. *Hosiery Motor-Mend Corp.,* 72 Fed. 405 (C. C. A. 2nd); *ex parte Bowles,* 24 U. S. P. Q. 266.

Other decisions consider the *Millburn* case, *supra,* as permitting the prior filed patent to constitute part of the prior art, as for example, *Denaro* v. *Maryland Baking Co.,* 40 Fed. (2nd) 513 (Md. 1930); *Hazletine Corp.* v. *Service Corp.,* 8 Fed., Supp. 100 (E. D. N. Y. 1934).

No case is known which has sustained the view that Carlton may be considered as prior knowledge under the circumstances relating to his filing date to that of appellant's filing date in the Patent Office.

There Can be no Presumption From Concurrent Decisions in View of the New Testimony Adduced.

The rule has been established, in the Court of Customs and Patent Appeals and in the Court of Appeals of the District of Columbia (at least, before appeals from the Patent Office were transferred to the jurisdiction of the C. C. P. A.) that the concurrent decisions of the Patent Office tribunals will not be reversed unless manifestly wrong.

In all decisions applying this rule, the case was an appeal under Section 4911, R. S. The rule does not apply, at least not to the same extent, in equity suits taken under Section 4915 R. S. This is because an equity suit under 4915 is not a technical appeal as in the case of an appeal taken under 4911, but is a new case with a record de novo.

Under Section 4911 R. S., the case on appeal must be confined to the record made before the Patent Office tribunals and no other evidence may be introduced. In a suit in equity under Section 4915 R. S., on the other hand, either party, that is, the plaintiff (here appellant) or the Patent Office, may introduce new evidence not previously before the Patent Office tribunals. *Butterworth* v. *Hoe,* 112 U. S. 50; *Lucke* v. *Coe, Comm. of Patents,* (App. D. C.) 28 P. Q. 178; 69 Fed. (2nd) 379.

These facts are mentioned for the reason that the general rule above stated as to concurrent decisions in the Patent Office, is open to an exception where there has been an introduction of new evidence not before the Patent Office tribunals. *In re Demarest,* 38 Fed. (2nd) 895; 396 O. G. 4; 5 P. Q. 223; *In re Wietzel* 39 Fed. (2nd) 669; 5 P. Q. 177; *In re Anthaltzer,* 9 P. Q. 53; 48 Fed. (2nd) 657; 18 C. C. P. A. 1181. The exception to the rule as to concurrent decisions has also been applied by the Supreme Court of the District of Columbia as to a prior decision by the Court of Customs and Patent Appeals, *Magness* v. *Robertson, Commissioner of Patents,* 21 P. Q. 260.

The reason for this exception to the rule is indicated in the decision in re *Demarest,* supra, to be based upon the fact that where the Appellate Court is not given the benefit of expert testimony, it must fall back upon the experts of the Patent Office who have rendered the concurrent decisions. In the instant case, while the solicitor for the Patent Office did not introduce any new evidence on any of the issues here involved, the appellant introduced the testimony of the undisputed expert, Dr. Barsky.

In the instant case, the appellant, Luxmore, has introduced extended testimony and evidence, by an experienced practical chemical engineer with practical experience in the field to which appellant's invention relates, to aid the Supreme Court of the District of Columbia on the issues involved.

Moreover, the rule relating to concurrent decisions in the Patent Office applies only to questions of fact, *Kennicot* v. *Kaps* (App. D. C. 271 O. G. 361; 262 F. 641). The rule never applies upon questions of law. *Orcutt* v. *McDonald, Jr. and McDonald,* 123 O. G. 1287 (1906); *Bourn* v. *Hill, Jr.* 123 O. G. 1284 (1906).

Appellant's process is an unobvious and patentable advance.

It becomes apparent that the issue in this suit is the position by the Patent Office tribunals that appellant's process was an *obvious,* and not a patentable, variation. Obviousness is variously defined as—

> "* * * * apparent; easily discovered, seen or understood; evident; manifest; palpable; plain; readily perceived by the eye or the intellect; the quality of lying in one's way or before one's eye; * * *" *46 C. J. 891.*

It is also defined in *Tolfree* v. *Wetzler,* 22 Fed. (2) 214, on 223, as follows:

> "What is obvious presents itself readily to the eye of everyone; it is seen at the first glance and is opposed to that which is abstruse."

In patent cases, obviousness is determined by what is expected of the "skilled worker". The Court in *Tolfree* v. *Wetzler, supra,* on page 223, has laid down the following test:

> "The test of what is obvious to a person skilled in the art and acquainted with the common knowledge in that art at the date of the patent".

citing—

> *Hendy* v. *Golden State Iron Works,* 127 U. S. 370;
>
> *Landesmann* v. *Jonassen,* 32 Fed. 590, appeal dismissed 140 U. S. 686; 11 S. Ct. 1023, 35 L. Ed. 601;
>
> *Lyon* v. *Goddard,* 10 R. P. C. (Eng.) 334.

The facts referred to above are believed to show abundantly that a person skilled in the art would obviously follow the procedure of Klingspor and Graft, and this applies also to Carlton, with Carlton's materials. This process, however, fails in obtaining the end point of increased flexibility and adhesion, the new and unexpected result following from appellant's process.

The apparent simplicity of appellant's process, when once pointed out, does not negative inventive skill. Simplicity and evident fitness are no sign of absence of inventive skill.

See McFarland et al vs. *Spencer et al*, 23 Fed. 150, on 151.

The record and the facts show the lack of any suggestion in the art of appellant's process and the variation from the suggestion in the art, with the result that a serious problem is solved and a new and beneficial property is achieved in the end product. Some basis for determining whether this change constitutes invention may be gathered from *Amus* vs. *Alden,* 27 Fed. 684, on 687—

> "What constitutes invention in the legal sense is difficult of exact definition in terms. Where, however, an old device or machine in general use, with acknowledged serious defects, * * * is taken in hand, and by changing its form or structure, they are removed and a different and improved result obtained, it may safely be affirmed that the change required invention."

Appellant has urged the beneficial and unexpected result obtained by the variation of his process, urging the utility of the new end product as evidence of the exercise of inventive skill. The proof of utility by the change in procedure, not expected to be exercised by those skilled in the art is a sufficiency of invention to support a patent.

Robinson on Patents, Vol. 1, Sec. 116, Note 1, is cited as follows:

> "The utility of the change as ascertained by its consequences is the real practical test of the sufficiency of an invention, and since one cannot exist without the other, the existence of one may be presumed as proof of the existence of the other. Where the utility is proved to exist in any degree, a sufficiency of invention to support the patent must be presumed."

As further determinative of the existence of an inventive act, the failure of the record to show any identity of procedure, coupled with the new and unexpected result following therefrom is highly persuasive of the existence of invention.

Robinson on Patents, Vol. 1, Sec. 117, page 169, under the heading "Intrinsic Novelty of a Concrete Invention Evidenced by the Novelty of the End Accomplished" states:

> "Thus, while identity of end is no proof of identity of means, diversity of end cannot exist without diversity of means, and every really new result furnishes, in itself, conclusive evidence that the cause by which it is produced is also new. Any invention, therefore, which accomplishes an end never before attained must be intrinsically new and unless evidently a mere constructive union of known factors must, likewise, have originated in a new inventive act."

Despite the fact that the art does not show any analogous procedure to that claimed by Plaintiff, the drastically different character of the constituents used in Graft and Klingspor furnishes no clue as to what may be expected with *Plaintiff's material,* i.e., the new material Bakelite in sandpaper, contemporaneously invented with Carlton. In chemical processes the doctrine of mechanical equivalents, from which an analogy may be drawn, cannot be applied.

See

> *Naylor* v. *Alsop Process Co.,* 168 Fed. at 919—
>
> "Reasoning by analogy in a complex field like chemistry is very much more restricted than in a simple field like mechanics. * * * You cannot apply the doctrine of mechanical equivalents to a chemical patent."

See also

> *Toledo Rex Spray Co.* v. *California Spray Chemical Co.,* 268 Fed. at 204—
>
> "Mere analogy is not in chemistry, usually so certain an index as in mechanics."

Carlton and Luxmore, the inventor, being *contemporaneous,* and Graft and art exemplified by Klingspor showing characteristically different material, anticipation may only be founded upon a disclosure of similar materials acted upon by the same physical forces.

See

> *Celluloid Mfg. Co.* v. *Russell,* 37 Fed. at 679—
>
> "The patent being for a process, each ingredient and each step is necessary to make the operation a success. * * * The materials may all have been ready at hand but unless they

> were combined by others in the manner described by the inventors, there is no anticipation."

The fact that a change in degree over Carlton has been made is not determinative of lack of patentable merit. The new, beneficial and unexpected results in the face of long existing practice, variation from which would be expected to be followed by detrimental results, sufficient of itself to discourage pursuit of that practice, is highly persuasive of patentable merit.

> See *Meade Morrison Mfg. Co.* vs. *Exeter Machine Works,* 196 Fed. 789, on 790—
>
> "The presence of patentable invention or its breadth or importance does not depend upon the mere extent or completeness with which the inventor has modified or altered pre-existing devices. It depends, rather, on the new and beneficial result accomplished in its particular art and the smallest and seemingly most obvious changes have often produced the most beneficial results in well recognized inventions. This also may be the criterion for considering whether an assemblage of elements constitutes a patentable combination or an aggregation.".

citing—

> *Goss Printing-Press Co.* v. *Scott,* 108 Fed. 253; 47 C. C. A. 302;
>
> *Lambert Hoisting Engine Co.* v. *Lidgerwood,* 154 Fed. 372, 83 C. C. A. 350;
>
> *Loom Co.* v. *Higgins,* 105 U. S. 580, 26 L. Ed. 1177.

The new and important results achieved by appellant warrant the reversal of the lower court's decision and that of the Patent Office tribunal. *In* *re Pupin* (App. D. C. 1924) 299 Fed. 697; *ex parte Austin* (C. C. P. A. 1934); 68 Fed. (2nd) 739; *ex parte George* (C. C. P. A. 1934) 68 Fed. (2nd) 571.

Even the mere discovery of a defect in the prior art, and even assuming that Carlton is also prior art, is sufficient to sustain appellant's process as contributing patentable novelty. *Ex parte Hamilton* (C. C. P. A. 1933) 64 Fed. (2nd.) 141.

With the set of facts as presented by the discovery of Carlton's bond for sandpaper, even if this disclosure was prior knowledge to applicant of which he may be charged with knowledge, the discovery of the difficulty involved in such device so far as flexibility is concerned is of itself sufficient to predicate patentable novelty. Obviously, Carlton lacking the force of prior knowledge, the independent discovery of the difficulty for producing a flexible sandpaper employing the ingredients disclosed by Carlton brands appellant's process with patentable merit. See *Judelson* v. *Hill Laundry Equipment Co.* (C. C. A. 2nd Cir. 1927), 22 Fed. (2nd) 253.

CONCLUSION.

We therefore respectfully submit that appellant is the first in the art to conceive of the novel concept for a process for producing the sandpaper employing as the constituent the synthetic resinous condensation product of the flexible character heretofore not achieved and that the association of the manipulative steps making possible such product with the ingredients appellant employs is a material, substantial and patentable advance over the art, the advantages of which deserve the protection contemplated by the patent statutes and is deserving of patentable merit.

Appellant is therefore clearly entitled to the appealed claims and the decision of the Court below and the Patent Office Tribunals should be reversed.

Respectfully,

H. H. Benjamin,
Solicitor for Plaintiff.

Paul Carpenter,
J. T. Basseches,
Of Counsel.

March 4, 1936.

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA
FILED MAR 23 1936
Henry W. Hodges
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No. 6584

In the United States Court of Appeals for the District of Columbia

OCTOBER TERM, 1935

MINNESOTA MINING AND MANUFACTURING COMPANY,
APPELLANT
v.
CONWAY P. COE, COMMISSIONER OF PATENTS,
APPELLEE

APPEAL FROM THE SUPREME COURT OF THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

R. F. WHITEHEAD,
Solicitor, United States Patent Office.

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This is an appeal by the plaintiff below from the decree of the Supreme Court of the District of Columbia (R., p. 9) dismissing the bill of complaint which had been brought under Section 4915 R. S. (35 U. S. C. A. 63).

Plaintiff sought to have the court below authorize the Commissioner of Patents to issue a patent containing certain specified claims upon the application of its assignor, William Luxmore, which application was identified by Serial No. 50,477.

That application, as filed (R., p. 25 et seq.), was concerned with a flexible abrader and the process of making it. In ordinary language the article is referred to as sand paper.

The alleged novelty consisted in using as a binder for attaching the abradant to the backing of paper, or other suitable material, a phenolic condensation product, and the process consisted, in first impregnating the sheet of paper with a thin flexible phenol-aldehyde resin varnish, then applying another coat of that varnish to the sheet, and applying the abrasive to that latter coat, to be retained by it when that material was hardened by baking.

The application was placed in interference with an application of Carlton and an application of Klingspor. A decision was rendered against the latter because of the date of invention alleged by him, and Luxmore conceded priority to Carlton as to the invention covered by the claims in issue in the interference. A patent was subsequently issued to each of the parties, the Klingspor patent appearing in the Record, beginning on page 96, and has been introduced as Plaintiff's Exhibit No. 2, and the Carlton patent appearing in the Record, beginning on page 98, and has been introduced as Defendant's Exhibit No. 1.

That interference involved a number of claims now appearing in the Carlton patent, of which claim 1 for the article, and claim 6 for the process, are illustrative:

> 1. The new article of manufacture, flexible sandpaper, which includes a backing, a grit or layer of abrasive particles, and a bond for uniting the grit to the backing including a synthetic resinous condensation product which is solidified to a flexible and waterproof state.
>
> 6. The process of forming a flexible waterproof abrasive article which comprises condensing an aldehyde and a phenol in the presence of a catalyst at low temperatures to produce an adhesive product, applying such products together with an abrasive grit to a suitable backing, and heating said product whereby to form an abrasive device which is flexible when solidified and insoluble in the presence of moisture and friction.

After the interference was terminated by judgment against Luxmore, he introduced into his application the claims involved in this suit and they were rejected as not being patentable over the Carlton patent in view of the decision in the interference awarding priority to Carlton, and the patent to Graft (R. p. 104 et seq).

Of the claims here involved, claims 25 and 29 are illustrative:

> 25. The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous presizing coating to said backing and permitting the same to partially set, then applying a binder and a coating of similar material

and grit to said backing to form the complete abrasive article.

29. The method of making an abrasive article which includes as steps thereof, employing a backing, applying a synthetic resinous condensation product in a volatile thinner to penetrate the backing and saturate the fibres, airdrying the sheet so treated to partially set the resinous impregnating coating, applying a binder coat of a synthetic resinous composition, partially setting the binder coat so applied, anchoring a grit or layer of abrasive particles in the binder coat and then finally baking the article so made.

Admittedly the essential point of novelty in these claims over what is shown in the prior art is that after the presizing coating is applied to the backing, that coating is permitted to be "partially set" before the binding coating is applied. (See first complete paragraph of page 10 of Appellant's Brief.)

The Carlton patent discloses not only the use of a phenolic condensation product as a binder, but discloses that more than one coating of that product may be applied to the backing. See page 3 of the patent (R. p. 100) in which it is said:

> I have found in practice that the number of coats of the binder may also beneficially be varied * * *.

And further:

> I have also discovered that my improved binder may be suitably modified to permit

> its beneficial use as an auxiliary coating for waterproofing one or both sides of the base * * *.

This matter is again referred to on page 4 of the patent, in the paragraph commencing with line 18.

Thus it appears that Carlton, who was held to be the first inventor of the invention defined by the claims of the interference and who, in view of that decision, must be held to be the first inventor of anything common to his application and the application of Luxmore, discloses clearly the use of the phenolic condensation product as a binder and the use of more than one coating. He does not state in his specification whether that original coating is to be dried, partially dried, or not dried at all. The single question involved in this appeal, therefore, is whether the claims which specify that after applying the first coat it is allowed to "partially set" before the second coat is applied defines anything of invention over the patents of record.

Before discussing that question it is deemed desirable to refer to the contention raised in appellant's brief on page 18 et seq., that the claims cannot be rejected on the theory that they define only something that is not inventive over the Carlton disclosure.

No decision whatever is cited in support of any such theory and it is submitted that the argument absolutely ignores the requirement of the statute that a person may obtain a patent only if he has "invented or discovered" a new and useful art, machine, etc. (See Section 4886 R. S.)

The question here involved is not whether some prior publication precludes the allowance of these claims, either because the date of that publication was prior to Luxmore's alleged invention or more than two years prior to his application, but is whether Luxmore made any invention over that of Carlton who, by Luxmore's own admission, was the first to make the invention defined by the claims of the interference.

The fact that Carlton's application was filed after Luxmore's application has nothing to do with the case. The date when an application is filed is evidence that the invention had been made by the applicant as early as that date but it is in no way conclusive that the date of the filing of the application was the date when the applicant made the invention and in any proceeding it would be competent to establish the date when applicant actually made his invention. Obviously Luxmore could not have obtained a patent on that which he admitted had been previously invented by Carlton, nor, it is submitted, in any proper interpretation of the statute could he be permitted to obtain a patent for that which was not inventively different from the prior work of Carlton.

Not only is no pertinent decision cited in support of the contention but it is submitted that the decision of this Court in *Ex parte Prichard,* 57

App. D. C. 347, 1928 C. D. 11, is directly contrary thereto. It appears in that case that in an interference in which the Prichard application had been involved the tribunals of the Patent Office had held that Prichard's opponent, Setzler, was the first inventor of the invention of claim 1 of the issue, but that he could not make count 2 of the issue of the interference because it contained a limitation not readable upon his disclosure. Priority, therefore, was awarded to Prichard as to count 2 with the recommendation that the claim be refused him as not being inventively different from count 1, which had been awarded to Setzler. That decision was affirmed by the Court of Appeals of the District of Columbia (54 App. D. C. 266, 1924 C. D. 240) with the statement that it could not consider in that proceeding the patentability of count 2 to Prichard. On the subsequent appeal in the Prichard application the Court, of course, had that question before it and held that the claim was properly rejected.

With reference to the grounds of rejection the Court said:

> The appealed claim does not contain the limitation that the additional hydrocarbons are supplied "during the cracking operation", and the Office would not be justified in reading any such limitation into the claim. Giving to the claim the broadest interpretation that it will reasonably support, it clearly fails to define anything of patent-

> able merit over count 1. In fact, the process defined by count 1 would be without substantial utility without "supplying additional quantities of the hydrocarbon under treatment."
>
> * * * * *
>
> And it is also fundamental that the subject matter of patents must be patentably distinct from each other.

As to the question of the patentability of the claims here sought over the references of record, it is to be noted that when the Luxmore application was filed there was no suggestion of any invention such as now set out in the claims. The only reference to the partial drying of the initial coat was as follows:

> After the aforesaid impregnating operation has been accomplished the sheet is permitted partially to dry—say for about thirty minutes at room temperature.

None of the claims presented prior to the interference made any reference to this step in the process.

It should be noted that this drying has nothing to do with the conversion of the phenolic condensation product into a flexible insoluble material, as specified in the application, by the "baking" process. In other words, this drying is not the so-called "curing" of the phenolic product by heat.

This statement is made because in the testimony presented there is some statement as to the "double curing" of the original coating if it were allowed to completely dry before the second coating were placed thereon.

Apparently, though no reference is made thereto in the specification or in the testimony, this "drying" is simply allowing the solvents with which the condensation product had been thinned to evaporate until the coating had acquired such consistency that the next coat would not penetrate the paper.

The Graft patent describes the putting on of successive coats of a waterproof material, the last of which is to include the abrasive, and letting the first coat dry before the second coat is put thereon. This was obviously due to the character of the waterproofing material used by Graft, which is explained by the witness (R. p. 14) was collodion, which dries solely by the evaporation of the solvents.

It may be noted that the application itself sets out no particular advantage for the so-called "partially drying." It is submitted, therefore, that there is nothing inventive in it. The first coat was dried to some extent since otherwise one coat would be placed upon the other in the same state so that the two coats would be the same as one heavy coat, and, without delaying the operation long enough to completely dry the first coat, it would be in condition to prevent the penetration of the second coat.

While, as pointed out above, there is nothing to indicate that this "drying" had any reference to the change in the state of the phenolic condensation product due to the baking operation, it is submitted that if it has such meaning then it is obvious that there should be no preliminary conversion of that product. It is obvious that any such preliminary conversion would over-cure the product when the baking took place after the second coating was applied and thus render the sheet less flexible. This would certainly be true because it was well known that the character of the product changed with the length of time that it was baked.

It is submitted therefore that the claims here involved define nothing inventive over what was shown to be the prior invention of Carlton and that the decree of the Supreme Court of the District of Columbia should be affirmed.

R. F. WHITEHEAD,
Solicitor for the Patent Office,
Attorney for Appellee.

MARCH 10, 1936.

U. S. GOVERNMENT PRINTING OFFICE: 1936